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VOL. II.—31ST YEAR.

SYDNEY, SATURDAY, OCTOBER 21, 1944.

No. 17.

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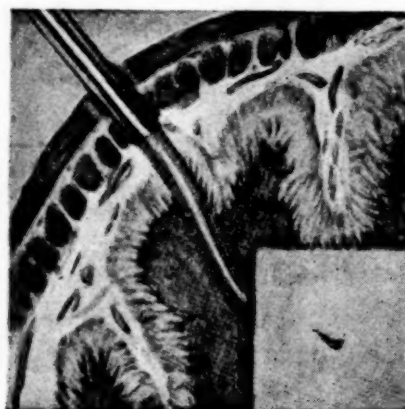
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MEDICINAL INDUCTION OF LABOUR AND INDUCTION IN POST-MATURITY.¹

By W. IVON HAYES,
Melbourne.

TWEEDY, of Dublin, was, I believe, the first to use castor oil, quinine and pituitrin as a means of inducing labour. He endeavoured to concentrate the effect of each by giving the quinine two hours and the pituitrin four hours after the oil (Table I), and he used this treatment partly as a test of maturity and partly to obtain the birth of the child before his bedtime. Three years later, in 1922, Watson, of Edinburgh, published his more elaborate method, in which the pituitrin was withheld and given only if the uterus failed to respond to castor oil, an enema and quinine (Table I). From this time medicinal induction of labour was widely and extensively used in every variety of case, but it soon became apparent that there were dangers associated with the treatment due to the large doses of quinine and pituitrin employed. There was evidence to show that large doses of quinine might cause fetal death, permanent deafness in the child and post-partum hæmorrhage, while the pituitrin by evoking powerful uterine contractions was apt to produce fetal death or ruptured uterus. Pituitrin, even in small doses, often brings about a deterioration in the condition of patients with renal toxæmia, and rarely it excites an alarming reaction in those allergic to it. For these reasons the amount of quinine and pituitrin has been gradually decreased, but in spite of this the effect of the treatment is often unexpectedly severe. Owing to the present shortage of quinine, the routine at the Women's

Hospital (Table I) has been "telescoped" by starting the pituitrin administration two hours after that of the castor oil, while adherents of the original Tweedy method retain the interval of four hours between the castor oil and the pituitrin, and give an enema half an hour before the first dose of pituitrin.

A recent important addition to the routine medicinal treatment has been the preliminary administration of stilbæstrol when the uterus contains a dead fetus. The patient is given a capsule containing twenty milligrammes of stilbæstrol twice a day for three days, with medicinal stimulation on the third day. If it is not immediately successful, the whole treatment may be repeated some time later.

Indications.

Despite the fact that during the period from July, 1940, to December, 1942, one of every eight patients delivered at the Women's Hospital has received a course of medicinal stimulation, and more than half of these (one in fourteen) for maturity or post-maturity, there are few indications for medicinal induction of labour. An induction to suit the convenience of either the patient or the doctor is medically and probably legally indefensible. Ante-partum hæmorrhage, a previous Cæsarean section and the presence of disproportion are obvious contraindications, while hydramnios is better treated by rupture of the membranes. The administration of pituitrin in cases of cardiac insufficiency may be fraught with danger and should not be used. It is not only unnecessary, but harmful, to induce labour for maturity or post-maturity, as will be shown later.

The indications for the medicinal induction of labour are four.

1. In hypertension, renal toxæmia, chronic nephritis, pyelitis and pyelonephritis medicinal induction may be used once, if the head is low and the cervix partly obliterated; otherwise a surgical induction should be used.

¹Part of a symposium held by the obstetric staff of the Women's Hospital, Melbourne, on June 21, 1944.

TABLE I.
Methods of Medicinal Induction of Labour.

Twoody.	Watson.	Women's Hospital, Melbourne.
6 a.m. Castor oil, 1 ounce.	6 a.m. Castor oil, 1 ounce.	6 a.m. Castor oil, 1 ounce.
8 a.m. Quinine bishydrochloride, 20 grains.	7 a.m. Quinine sulphate, 10 grains.	7 a.m. Enema and hot shower.
10 a.m. Pituitrin, 0.5 cubic centimetre; repeat three times at intervals of half an hour.	8 a.m. Enema.	8 a.m. Quinine sulphate, 2.5 or 5.0 grains.
	9 a.m. Quinine sulphate, 10 grains.	9 a.m. Repeat quinine.
	11 a.m. Quinine sulphate, 10 grains.	10 a.m. Repeat quinine.
	7 p.m. Pituitrin, 0.5 cubic centimetre; repeat twice at intervals of half an hour.	11 a.m. Pituitrin, 4.0 minims; repeat three times. (Pilocin replaces pituitrin if systolic blood pressure is 160 millimetres of mercury or more.)

2. If premature rupture of the membranes has occurred, medicinal induction may be used once, or repeated, but not if disproportion is present.

3. If the foetus is dead, medicinal induction may be used with stilbestrol in the manner already described.

4. Medicinal induction may be used as an adjuvant to surgical induction, which may be performed during the medicinal treatment (Johns Hopkins) or later if the surgical induction appears ineffective.

Induction for Maturity and Post-Maturity.

Is maturity or post-maturity a justifiable indication for induction of labour? Authoritative opinion varies not only considerably, but also completely on this subject. Munro Kerr⁽¹⁾ makes the following statement: "The mortality amongst post-mature foetuses is considerable. So unsatisfactory were my results in two cases that I now bring on labour whenever I am satisfied that pregnancy is at or near term. Should it be decided to bring on labour, the simplest treatment is to rupture the membranes." The opinion at the Queen Charlotte's Hospital⁽²⁾ is: "Post-mature babies may die before or during labour. This is possibly due to degeneration of the placenta. It is possible that over-ossification of the skull interferes with moulding. Labour should generally be induced whenever the patient is more than a fortnight over time." Bourne⁽³⁾ states that "one does not make the definite diagnosis of post-maturity with its consequent induction of labour till three weeks beyond the date thus fixed has passed. But induction may have been decided on during this three weeks if in addition to suspect post-maturity, disproportion may also have been suspected". De Lee⁽⁴⁾ writes: "Why interfere with normal pregnancy? When a gravida is surely going over term, the question of inducing labour comes up, but one must be ultra-conservative. More harm than good may be done." The opinion of Greenhill⁽⁵⁾ is: "The important thing to bear in mind is that there is no justification for the induction of labour or the performance of a Caesarean

section simply because a patient has gone three or four weeks past the calculated date."

In order to form an opinion of my own, an inquiry has been made into those cases at the hospital from July, 1940, to December, 1942, in which medicinal induction of labour has been employed solely because of maturity or post-maturity. As may be seen from Table II, the treatment appeared eminently successful, 549 of 644 patients coming into labour after a number of stimulations varying from one to seven. Of these, the majority fall into three groups according to whether the induction was attempted at the fortieth, the forty-second or the forty-fourth week; the remainder (eighteen) are few and present no feature of interest, so they will not be considered at present. The weight of the children varies remarkably, the smallest (four pounds two and a half ounces) and the largest (eleven pounds seven and a half ounces) both being delivered at the forty-second week; this fact shows that the calculated date seemed to overshadow all other considerations (Table III). The average

TABLE III.

Weight of Foetus. (Pounds.)	40 Weeks' Gestation.	42 Weeks' Gestation.	44 Weeks' Gestation.
11 to 12	0	2	0
10 to 11	10	16	7
9 to 10	12	43	19
8 to 9	38	87	30
7 to 8	59	85	33
6 to 7	33	31	7
5 to 6	9	4	1
4 to 5	0	2	0

weight increased by six ounces between the fortieth and forty-second weeks, but by only three ounces between the forty-second and forty-fourth weeks; this bears out the opinion of Rathbun,⁽⁶⁾ who thinks that the foetus loses the

TABLE II.
Successful Medicinal Induction Followed by Vaginal Delivery (546 Cases).¹

Period of Gestation. (Weeks.)	Number of Cases.	Average Weight of Foetus. lb. oz.	Fetal Death.			Forceps Deliveries.
			Stillbirth.	Neonatal Death.	Percentage.	
40	161	7 12	7	2	5.6	17 (10.5%)
41	13	7 9	9	2	4.1	27 (10.0%)
42	270	8 2				
43	1	8 9	5	3	8.2	13 (13.4%)
44	97	8 5				
45	3	9 0				
46	1	8 11				

¹ Successful medicinal induction was followed by Caesarean section in three cases. Two primiparae, at 42 weeks' gestation, had an unsuccessful trial of labour; the children each weighed seven pounds seven ounces. A multipara, pregnant for the sixth time, at 40 weeks' gestation, had post-operative cervical atresia; the child weighed eight pounds three and a half ounces (a previous child weighed eight pounds four ounces).

tendency to gain in weight after it is twenty days post-maturity. The foetal death rate and the incidence of forceps delivery, which may be taken as criteria of dystocia, suggest that an easier labour occurs at the forty-second week, but a more difficult one at the forty-fourth week, as compared with labour at term; but if the three groups are taken together, they yield a foetal death rate of 5.3% and a forceps delivery rate of 10.8%, both of which compare unfavourably with our hospital standards (Table IV). The

TABLE IV.

Abnormality.	Women's Hospital, Melbourne (11,000 Cases).	Successful Medical Induction (528 Cases).	Normal Onset after Unsuccessful Medical Induction (70 Cases).
Foetal death	4.7% (Premature infants excluded)	5.3%	4.3%
Forceps delivery.	7.0%	10.8%	7.1%

apparent explanation of this is that the cases were abnormal, in that post-maturity was present and that the dystocia would have been even worse if labour had not been induced when it was; but what really would have happened, had these patients been allowed to continue with their pregnancies, may be seen in Table V. Here

TABLE V.

Unsuccessful Medical Induction Followed Later by Normal Onset of Labour (70 Cases).¹

Delay before Normal Onset of Labour, (Days.)	Number of Cases.	Remarks.
1 to 7	20	1 stillbirth, 1 neonatal death, 2 forceps deliveries.
8 to 14	18	1 forceps delivery.
15 to 21	20	1 stillbirth, 2 forceps deliveries.
22 to 28	6	
Over 28	6	

¹ Average weight of children, eight pounds three ounces, three foetal deaths, five forceps deliveries.

are the records of seventy patients who were treated unsuccessfully with medical stimulation and were then sent home, to return later after a natural onset of labour. The average weight of the children born was eight pounds three ounces, which is exactly the average of those born to the 367 patients who had a successful induction at the forty-second and forty-fourth weeks, so presumably these cases are comparable. The foetal death rate and forceps delivery rate in the cases without induction were 4.3% and 7.1% respectively, which was appreciably lower than in the induction cases. Thus if we accept seventy as a sufficient number on which to base a conclusion, this proves that the induction of labour because of maturity and post-maturity is quite unnecessary and actually harmful. This opinion will be amplified by the records of 25 patients who had surgical induction after an unsuccessful medical induction. Fifteen women had children smaller than they had borne successfully before, and the one stillbirth was probably the direct consequence of the method of induction. The details are as follows. Twenty-two patients were treated by artificial rupture of the membranes and medicinal induction; no forceps were used, the average weight of the children was eight pounds five ounces, and there was one stillbirth due to prolapse of the cord; three patients were *primiparae*, fifteen patients bore children smaller than they had successfully borne before, and four patients bore children larger than they had successfully borne before. Three patients were treated by tubal induction and medicinal induction; the average weight of the children was eight pounds thirteen ounces; all the children were slightly larger than the patients had previously borne, but no forceps were used and no foetal death occurred.

Discussion.

Since Naegele enunciated the rule for calculating 280 days from the first day of the last menstrual period, this has been universally accepted as the method of determining the average date of maturity of the human foetus. Many women, however, seem to bring their children to a state of maturity either much earlier or much later than the two hundred and eightieth day, so we are not justified in considering a child born either before or after the calculated date as either premature or post-mature on that account. Similarly the weight and the size of the child are not absolute criteria of the duration of its intrauterine development, for although the average child at birth is seven and a half pounds in weight and twenty inches long, variations from these figures do not decide a state of prematurity or post-maturity. From what has been said, it is obvious that it is impossible to determine in any particular case exactly when maturity is reached and consequently when post-maturity begins.

The fear has been expressed that "post-maturity kills babies", and various reasons are given in support of this. One is that the foetus dies of intrauterine senility due to degenerative changes in the placenta. Rarely, a child is born with the supposedly characteristic appearances of post-maturity, but this occurs so exceptionally that it is doubtful whether post-maturity is the sole cause, and it is significant that post-maturity is not mentioned in the international list of causes of death. Another reason is that the child's skull grows harder, so that normal moulding is prevented; but there is no scientific basis for this belief. A third reason is that the child grows steadily, so that disproportion is likely to arise and cause dystocia, and this is the chief reason why induction of labour has become so popular a treatment in cases of maturity and post-maturity. The problem of post-maturity is therefore the problem of possible disproportion between the size of the child and the size of the genital canal. Theoretically, there must be a time, possibly a certain week, in which if labour began, it would be perfectly normal in every way, but a continuance beyond that time would give rise to a labour accompanied by difficulty or danger to mother or child; however, from a practical point of view it is impossible to know or discover by any examination just when that particular time has arrived. This fact has unfortunately been lost sight of, and consequently there has grown up the fashion of attempting to induce labour at the correct moment, not on the basis of foetal size and possible disproportion, but on the basis of time alone. It is curious that the favourite time for interference is when the foetus is two weeks post-mature—a relic of the time when it was thought that conception took place immediately after the last menstrual period, but could exceptionally have begun two weeks later, that is, just before the first menstrual period missed. The induction of labour for post-maturity must also be condemned from another angle, that of the limitations and the dangers of the methods used.

There are certain cardinal rules for induction of labour which are often forgotten: (i) that no induction should be contemplated unless it is certain that the patient will suffer more danger if induction is not attempted; (ii) as a corollary to the first, that no induction should be started unless the termination of pregnancy is relentlessly pursued till successful; (iii) that no induction should be attempted if there is any disproportion between the size of the child and that of the birth canal. The first rule states simply that there must be good and sufficient reason before induction is undertaken, as definite risks and dangers may accompany the procedure. These are as follows. (i) The labour may be unnaturally hurried, with resulting abnormal pressure on the child and insufficient time for moulding, both of which increase the stillbirth rate. (ii) A small degree of disproportion may be present, which the unnaturally induced labour is unable to overcome, and inertia may result. (iii) The medicinal treatment may be unsuccessful. Is the treatment to be repeated indefinitely, or is the patient to be informed that it was really not necessary in the first place? (iv) The medicinal treatment may be successful in rupturing the membranes,

but the patient has inertia. Is Cæsarean section now the treatment? (v) Unsuccessful medicinal treatment may be followed by unsuccessful surgical induction. What is the solution of this problem?

The second rule means that when termination of pregnancy is decided upon because of the mother's danger, it must be successfully carried out by one method or another.

The third rule requires some explanation. When labour begins spontaneously or is induced, its continuance depends on the stimulation produced by pressure of the presenting part on the cervix, and when this is not present and progressive, uterine inertia results. When the presenting part is high, as in the case of posterior positions of the vertex, disproportion, contracted pelvis, hydramnios before rupture of the membranes, breech presentation, twins, pelvic tumours, *placenta prævia et cetera*, then medicinal induction is usually unsatisfactory, tubal induction is often unreliable (especially if the tubes prevent the presenting part from descending into the cervix), and even induction by artificial rupture of the membranes is not successful unless it allows or causes sufficient descent of the child. From what has been said, it is obvious that for a successful induction of labour, it is imperative that the child shall have an easy passage through the birth canal, unobstructed by its size, by its attitude or by any abnormality of the pelvis.

How, then, does all this affect the problem of the induction of labour in cases of maturity and post-maturity? An attempt has been made to point out that term, or the two hundred and eightieth day from the last menstrual period, is based only on an average duration of gestation, and that induction of labour based on dates alone causes a more difficult labour and a higher fetal mortality rate than if patients are allowed to enter labour spontaneously. Induction therefore increases rather than diminishes any danger. Some may think that even surgical induction is almost harmless, but few will carry a medicinal induction to its logical conclusion by surgical induction in cases of post-maturity in which medicinal treatment fails. Should disproportion be present, surely the worst possible treatment is to induce labour; but should no disproportion be present, the next worse possible treatment is to induce labour because the child may theoretically at some future date be too big to pass through the pelvis. To think otherwise justifies the induction of labour in all cases even before term is reached.

Conclusion.

In conclusion, it is strongly recommended that no induction be attempted for maturity or post-maturity. Patients should be allowed to wait until spontaneous labour begins, no matter when, for almost without exception natural and successful delivery will result. Of the exceptions, the majority will be cases of disproportion in which spontaneous delivery would not have occurred at the fortieth week, and there will be a rare case in which disproportion has arisen solely because of post-maturity. Will the avoidance of induction in cases of post-maturity lead to an increase in the number of Cæsarean sections? My considered opinion is that many more sections are required because of unsuccessful attempts at induction than are ever needed in cases in which disproportion arises through post-maturity.

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- ⁽³⁾ A. W. Bourne and L. Williams: "Recent Advances in Obstetrics and Gynecology", Fifth Edition, 1942, page 23.
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THE INDICATIONS FOR SURGICAL INDUCTION OF LABOUR.¹

By W. D. SALTAU,
Melbourne.

The accompanying table is a summary of the cases of surgical induction of labour at the Women's Hospital for a period of six years from 1938 to 1943:

TABLE I.
Indications for Induction of Labour.

Condition.	Method of Induction.	
	Rectal Tube.	Artificial Rupture of the Membranes.
Eclampsia	34	25
Pre-eclampsia	123	126
Hypertension	15	76
Chronic nephritis	18	9
Mild toxæmia	54	87
Pyelitis	9	8
Previous toxæmia	1	2
Hyperemesis (late)	1	2
Diabetes	2	5
Pulmonary tuberculosis	—	2
Cardiac failure	1	2
Maturity	—	3
Post-maturity	8	23
Previous erythroblastotic babies	2	—
Accidental hæmorrhage	4	—
<i>Placenta prævia</i>	1	5
Previous stillbirths	2	4
Previous large babies	—	2
Hydramnios	1	7
Miscellaneous	2	5
Total	278	393

It will be noted that the great majority of surgical inductions were for the various types of toxæmia—over 80%.

It is interesting to note the great increase in the incidence of artificial rupture of the membranes as compared with tubal induction. For the period 1939 to 1940 tubal induction predominated to the extent of 51 cases as compared with 41. In the following year the relative figures were much the same—69 cases to 52. In the period 1941-1942 there were 72 tubal inductions and 68 cases of artificial rupture of the membranes. In the following year a great change took place; the cases of artificial rupture of the membranes outnumbered those of tubal induction by 111 to 30.

Until the last year or two, one had been extremely conservative with regard to rupturing the membranes, but now with certain reservations this method of inducing labour is favoured. The reservations were that tubal induction was safer in the early cases—for example, 28 to 32 weeks' gestation—and also that rupture of the membranes was not suitable for the elderly *primipara*.

The risk of infection following tubal induction appeared to be greater than that following rupture of the membranes. In the whole series there were seven maternal deaths after tubal induction, and five of these were due to infection. Two deaths followed rupture of the membranes, and neither of these was due to infection.

It will be noted that in this series, 59 inductions were carried out for eclampsia. Except in one case, in which the membranes were ruptured during the occurrence of convulsive seizures, all these inductions took place at variable times after cessation of the seizures. It was sometimes a little difficult to select the most favourable time for termination of pregnancy. Thorough elimination should be effected, and then if the blood pressure has fallen, the albuminuria has diminished and the patient has had a good rest, steps should be taken to terminate the pregnancy within twenty-four to forty-eight hours.

¹Part of a symposium held by the obstetric staff of the Women's Hospital, Melbourne, on June 21, 1944.

It will be seen that cases of preeclampsia constituted the largest group amongst the cases of toxæmia in which surgical induction was practised. For purposes of classification, any patient whose urine contained more than "one-half" albumin and whose systolic blood pressure was 160 millimetres of mercury or higher was considered to be preeclamptic. After appropriate treatment the condition of many of these patients improves temporarily; but after three or four days most of the pregnancies should be terminated. The important consideration in this type of case is the best way of avoiding the onset of convulsive seizures. In the above series of 249 cases of preeclampsia, only eight patients became eclamptic subsequent to induction of labour, but none of them died. While these figures were impressive, another more striking fact was that seven of these cases of eclampsia had followed tubal induction, whereas only one occurred after rupture of the membranes. The explanation of this may be the time factor, in that labour tended to commence sooner and be shorter after rupture of the membranes than after tubal induction. The relief of intrauterine tension by the escape of a few ounces of amniotic fluid may also exert some favourable effect. My experience has been that some improvement in the condition of the preeclamptic patient, even if it is only temporary, often follows rupture of the membranes. Thus the results of surgical induction in cases of preeclampsia certainly justified the continuance of conservatism rather than radical methods of delivery.

In the group of cases classified as mild toxæmia, termination of pregnancy was frequently indicated. Although termination was not so urgent, it was unwise to allow these patients to carry on week after week, as permanent renal damage was more likely to result and the prospects of future child-bearing were endangered. Medicinal stimulation is always worth trying in these cases, and even if it is unsuccessful, it sometimes appears to sensitize the uterus for surgical induction.

A small group of cases comprises those in which the patient has persistent hypertension with perhaps only slight albuminuria. These are all potential cases of a more severe grade of toxæmia, and if term is near the pregnancy should be terminated.

An important but relatively small group is that in which the patient gives a history of toxæmia with a previous pregnancy. It is important to consider termination in the last week or so of these pregnancies to avert the development of a recurrent toxæmia. In my ante-natal clinic it is my practice to send these patients into hospital in the last fortnight of pregnancy, even though their clinical condition at the time of admission is quite satisfactory.

Late hyperemesis, although fortunately rare, is an extremely important condition. One realizes that these patients are extremely ill, and the wisdom of surgical induction as opposed to abdominal delivery is doubtful. However, there were no maternal deaths in the three cases listed in the table.

The patient with recurring or intractable pyelitis may be the subject for surgical induction, as she is sometimes very ill.

The diabetic mother also frequently provides an indication for termination of pregnancy. She is prone to have large babies, and there is the added risk of maceration.

It will be noticed that a few cases of cardiac failure were included in the table. The question of termination of pregnancy when a condition of acute cardiac failure exists is certainly open to doubt; but in the above cases the cardiac function had improved with appropriate treatment before induction of labour was performed.

With regard to surgical induction when there is a history of previous stillbirths, each case should be carefully considered on its merits. When it is suggested that the previous stillbirth was due to a large baby, surgical induction is well worthy of consideration if one is satisfied about the relationship of the foetal head to the pelvis in the second pregnancy; but if there is a suggestion of disproportion, induction is an unsafe procedure. It is safer to give such patients a course of medicinal stimulation and a subsequent limited trial of labour.

The question of post-maturity is extremely hard to assess. There is always the possibility of an error in dates. If the head is fixed and the baby is not unduly large, there is no need to worry. Medicinal stimulation is preferable to surgical induction in such cases.

THE METHODS OF SURGICAL INDUCTION OF LABOUR.¹

By A. M. HILL,
Melbourne.

THE two surgical methods of induction of labour employed at the Women's Hospital at the present time are the insertion of rectal tubes between the uterine wall and the amniotic sac, and artificial rupture of the membranes.

Tubal induction was introduced into obstetrics about the middle of the last century and is generally associated with the name of Krause, who employed bougies. In 1924 Fitzgibbon used a soft stomach tube in place of the rigid bougie, and still later the rectal tube came into favour.

Artificial rupture of the membranes is a method which dates back to antiquity and was used with varying fortune through the ages until it was entirely replaced in the last century by the bougie method. In recent years we have seen its rehabilitation as the method of choice.

Medical Preparation.

Surgical induction is best preceded by medicinal stimulation of the Watson type, which cleans out the lower bowel, generally increases the sensitivity of the uterus to the onset of labour, and at or near term may initiate labour without surgical assistance.

Methods vary in the spacing of the pituitrin injections relative to the surgical procedure. Some obstetricians perform surgical induction one or two hours after the last injection of pituitrin has been given, but a more usual and probably better procedure is to perform surgical induction one hour after the enema or last dose of quinine, and to follow it one hour later with the pituitrin. This is given in four to six intramuscular injections, each of 2-5 units, at intervals of half an hour. Should labour commence during the pituitrin injections, subsequent doses are withheld. In some centres the pituitrin is applied intranasally, but administration by injection is more accurate.

Technique.

The technique of surgical methods of induction is comparatively simple, but should be conducted with the care, if not the ceremonial, of a major operation. A first essential is efficient asepsis. Should the patient present any evidence of genital tract infection, as, for example, a vaginal discharge, surgical induction must be withheld until bacteriological investigation of vaginal smears and cultures has failed to reveal the presence of dangerous pathogenic bacteria.

Antiseptic Toilet.

The patient's genital area is washed with soap and water and shaved. She is then placed across the bed or at the foot of the bed in the lithotomy position. The obstetrician puts on a mask and thoroughly scrubs his hands and forearms in soap and water. He then carefully cleanses the vulva, perineum and surrounding skin with swabs soaked in "Dettol" (one in three solution), or preferably in "Dettol" cream, finally holding the labia apart with the fingers of the left hand while the vulval and vaginal entrance is similarly cleansed. He again scrubs his hands and forearms in soap and water, and puts on sterile gloves; if he is sure of his technique he will not require the protection of a sterile gown. The genital toilet is now repeated, care being taken to let only the swab and antiseptic solution, not the gloved fingers, touch the outer skin areas. After the inside of the vulval orifice has been swabbed with a generous supply of "Dettol" cream, the gloved hands are massaged with the same antiseptic agent.

¹ Part of a symposium held by the obstetric staff of the Women's Hospital, Melbourne, on June 21, 1944.

Towels, folded to at least two thicknesses, are then applied, the first over the lower part of the abdomen, and the second beneath the vulva and preferably clipped in the mid-line to the perineum so as to cover the anus. When "Dettol" is the antiseptic used, no strength less than one in three is efficient; an alternative antiseptic agent of at least equal efficacy is "Zephiran" concentrate, used in a strength of one teaspoonful to the pint of water, care always being taken to wash all traces of soap from the parts before applying "Zephiran". The patient is now ready for the surgical procedure.

Tubal Induction.

Tubal induction must be carried out under direct vision, and usually under general anaesthesia, the best anaesthetic agents being nitrous oxide and oxygen. A Sims speculum is inserted into the vagina, the anterior wall of the vagina is raised with an elevator, and the anterior cervical lip is grasped with a tenaculum or sponge-holding forceps. The vagina and cervix are now freely swabbed with "Dettol" (one in three solution) or "Dettol" cream, but rubbing and scrubbing are not permitted because they are damaging to the antibacterial biological integrity of the vaginal mucosa. The right index finger is passed into the cervical canal, this being facilitated, should the canal be closed, by removing the tenaculum and by using the left hand on the abdomen to exert counter-pressure on the foetal head, and so prevent the cervix from retreating before the pressure of the right hand.

The right index finger is passed into the cervical canal, an attempt being made to dilate it in the process, and should it be possible to insert two fingers, further dilatation still is attempted. Should it be impossible to insert one finger into the cervical canal, gradual dilatation is performed with Hegar's dilators.

The membranes are now carefully stripped off the lower uterine segment over as wide an area as possible by sweeping movements of the index finger. The speculum is reinserted, the tenaculum is reapplied, and one rectal tube, grasped three inches from its blunt end by a sponge-holding forceps or uterine-packing forceps, is introduced between the uterine wall and amniotic sac in short advances. To prevent the tube from coming into contact with the gloved hands or with the vaginal or vulval mucosa or skin, its free end, in addition to the portion being introduced, is held by a sponge-holding forceps, steadied, if necessary, by a nurse. The successive introductions of the tube are accomplished by progressive reapplication of the sponge-holders a few inches from the cervix. Should brisk haemorrhage occur at any stage, the tube must be removed and its reinsertion begun at another point, otherwise the risk of serious placental separation is run. Should haemorrhage persist or be unduly free, the method must be abandoned. Should the membranes accidentally rupture during insertion of the tube, the tube must be at once removed, and the method converted to that of artificial rupture of the membranes.

When the tube has been almost completely introduced, the free end is pushed well across the internal os to the lower uterine segment so as to render unlikely its expulsion into the cervical canal.

When one tube has been inserted comparatively easily, it is worth while to attempt the introduction of a second tube. This is most simply performed by inserting the blunt end of the second tube into the wide end of the first, and continuing the technique as already described.

The operation is completed by further swabbing of the cervical and vaginal mucosa, by the removal of instruments, and by the application of a sterile perineal pad. No plugging of the cervix or vagina is allowed. The rectal tubes used are of the hollow variety and are sterilized either by being autoclaved or by being boiled for twenty minutes on two occasions in the previous twelve hours. Whether or not labour ensues, the tubes are best removed in forty-eight hours because of the possibility thereafter of significant tissue damage or necrosis and the steadily increasing dangers of intrauterine infection.

Artificial Rupture of the Membranes.

Artificial rupture of the membranes may be performed under direct vision as is tubal induction, but a simpler

and better way, with less interference and exposure, is by the method of touch.

In this method, after the usual antiseptic vulval toilet, the right hand, lubricated with "Dettol" cream, is passed into the vagina, and the index finger is inserted into the cervical canal, where, as has already been described with regard to tubal induction, an attempt is made at further cervical stretching and at separation of the membranes off the lower uterine segment over as wide an area as possible. With the right index finger inside the cervical canal as a guide, the left hand now directs one arm of a tenaculum forceps along the right palm and palmar surface of the index finger, care being taken not to touch the vulval or perineal skin in transit, and so introduces the sharp point of the tenaculum into the uterine cavity.

The right hand now grasps the tenaculum, and with the left hand exerting counter-pressure on the foetal head through the abdomen, the obstetrician freely and firmly scratches the foetal scalp with the tenaculum point in several directions.

The tenaculum is withdrawn by the left hand, the right index finger returned to its position in the cervical canal, and, between the fingers of the right hand in the cervix and vaginal fornices, and the left hand on the abdomen, the foetal head is subjected to repeated, small, sharp ballottements, aided by occasional pressure in the patient's flanks from the nurse. This causes the intermittent escape of *liquor amnii*, and at least one-half to one pint should be released before the right hand is removed from the vagina.

The actual rupturing of the membranes is often a more difficult procedure than would appear from its description, and blunt instruments such as knitting needles are technically unsatisfactory. Some obstetricians employ a volsellum forceps and attempt to remove a portion of hair-bearing scalp so as to be certain that the amniotic sac has been perforated, but there is no place for unnecessary trauma in modern obstetrics. Others use both arms of a tenaculum in a method similar to that I have described, and others again use a Kocher's forceps. I know of no proven advantage in more complex apparatus such as the Drew-Smythe catheter, but cannot speak of it from personal experience.

The most important points in technique are, firstly, dilatation of the cervix and stripping up of the membranes from the lower uterine segment to the greatest possible extent, and secondly, the freeing of a sufficient quantity of liquor to act as a strong proprioceptive stimulus to the uterine muscle, and to enable the foetal head to be driven well down into the lower uterine segment and cervix. In most *multigravida* and in a considerable proportion of *primigravida* the operation can be performed without anaesthesia, and indeed many *multigravida* require no pre-operative sedative whatever.

It must be emphasized that artificial rupture of the membranes should not be performed unless one is reasonably certain that the presenting part can, after rupture of the membranes, come well down into the pelvis without disproportion and without malpresentation. The same principles, indeed, should govern the decision to perform any surgical method of induction of labour. In cases in which the cervix is long and closed, or in which Hegar's dilators are required to dilate the cervical canal, artificial rupture of the membranes is liable to prove not completely satisfactory, even though the head comes well down into the lower uterine segment, for in such cases the latent period from induction to the onset of labour is almost invariably long, and labour itself may be protracted and difficult. So true is this that the presence of a long, closed cervix is held by some American observers to be a complete contraindication to the use of artificial rupture of the membranes. On the other hand the converse is in general true, so that the shorter the cervix the shorter the latent period and the shorter the labour; cervical dilatation is, of course, always an advantage.

Comparison of Methods.

Let us now examine briefly the chief advantages and disadvantages of each method.

Tubal Induction.

Tubal induction still holds an honoured place owing to its general reliability. Although wide variations occur, labour begins in the majority of cases within or shortly after twenty-four hours, and the whole process is completed less than forty-eight hours from the time of induction. Under such conditions the results are generally excellent. But there are disadvantages and dangers inherent in the method which must be discussed.

Firstly, there is the fact of introduction into the uterus of a foreign body, with its possible immediate effects of placental separation and its possible later effects of tissue damage or necrosis. During labour the tube may act as a mechanical obstacle to the descent of the head, and this must be remembered in any case in which the progress of labour is delayed or difficult. A much more serious disadvantage, however, is the inevitable entrance of bacteria into the uterine cavity following tubal induction, the case-incidence of uterine bacterial invasion after the tube has been *in situ* for more than twenty-four hours being 100%. As Penfold and Butler have shown, this bacterial invasion, most commonly with faecal organisms, is directly responsible for a stillbirth and neonatal mortality rate which rises steadily the longer the birth is delayed.

This inevitable bacterial invasion of the uterus is the cause of a maternal morbidity above rather than below 15%, and precludes from every case after tubal induction the certainty of aseptic safety in later abdominal surgical procedures, should these be indicated. The potential dangers of serious infection are also revealed in the occasional maternal death which follows tubal induction alone, most often due to anaerobic organisms.

Artificial Rupture of the Membranes.

The immediate advantages of artificial rupture of the membranes lie in the relative simplicity of its performance, the minimal amount of interference, and the absence of introduction into the uterus of a foreign body. Its greatest advantages are its speed and efficiency in inducing and completing labour, and the comparative absence of ill-effects on mother and baby. The method works more successfully the nearer the patient is to term, and is increasingly efficacious after the thirty-fourth week. In the presence of great prematurity, as at the twenty-eighth week, it is less efficient; this is probably due to a combination of lowered hormonal and neuromuscular preparedness of the uterus for labour at this early stage, and inefficient driving force of the light, premature foetus.

Almost without exception labour following artificial rupture of the membranes is considerably shorter than normal labour under similar conditions, being on an average two-thirds or less than two-thirds as long as normal labour in *primigravidae*, and about half or less than half as long as normal in *multiparae*. As the Women's Hospital records show, the average time from induction to the birth of the child is twenty hours after this method, which is less than half the average time following tubal induction. Most significant is the minimal harm occasioned the baby and mother. The foetal mortality rate is almost exactly half that which follows tubal induction, while maternal morbidity is also of a lower order. Maternal death due solely to the method is a rarity.

Another great advantage of the method over tubal induction is the lower incidence of subsequent significant intrauterine infection, so that artificial rupture of the membranes, performed with efficient asepsis, does not necessarily preclude later abdominal surgical procedures. If such procedures are anticipated, however, they should be preceded and guided by bacteriological investigation of the vaginal and cervical flora. I have on a few occasions deliberately performed Caesarean section many hours after artificial rupture of the membranes because of confidence in the cleanliness of the method as confirmed by efficient bacteriological investigation. I have also found the vaginal flora to remain normal, only Döderlein's bacilli being found seven days after artificial rupture of the membranes, when the patient had not come into labour. This generally high degree and persistence of genital clean-

liness following the careful use of this method is a factor at present under investigation at this hospital, and holds promise in the future of an even wider field of utility.

Without further speculation, however, it can be said that artificial rupture of the membranes, though one of the oldest procedures, is still the simplest, swiftest and safest method of surgical induction known.

Function of the Bag of Waters.

It is important to note that the change from tubal induction to artificial rupture of the membranes as the surgical method of choice undoubtedly reflects a change in attitude as to the significance of the bag of waters.

Since Denman, in 1805, emphasized the apparent importance of the bag of waters as a hydrostatic dilator of the cervix, it had until comparatively recently been accepted as almost axiomatic that the bag of waters should be preserved for as long as possible during labour, both for its apparent function as a cervical dilator and for its action in protecting the foetal head from direct pressure against the cervix during the contractions of the first stage.

While we agree that the bulk of modern evidence is against this earlier teaching, let us take four well-known conditions that furnish information on the subject.

Premature Rupture of the Membranes.

The well-known ill-effects commonly suffered by mothers and babies in labours in which the membranes have ruptured prematurely are still sometimes cited in evidence that the bag of waters should be preserved in labour. Arguments attributing such ill-effects to premature rupture of the membranes, however, seldom bear close scrutiny, for the causes of dystocia and of maternal and foetal damage in these cases are almost invariably to be found in the conditions which precipitated the premature rupture, and not in the premature rupture itself. Premature rupture of the membranes is liable to occur in cases in which the presenting part does not fit accurately and firmly into the pelvis and cervix, cases in which, in brief, the cork does not fit the bottle, but is too small, or too large, or of the wrong shape. Hence it is that premature rupture most commonly occurs in cases of disproportion, malpresentation, contracted pelvis, twins, hydramnios, *placenta praevia*, pelvic tumours, monstrosities or simply prematurity, all of which are themselves known causes of dystocia or maternal or foetal morbidity.

Obstruction Due to the Bag of Waters.

Every obstetrician has seen cases in which labour has been unnecessarily prolonged by failure of the membranes to rupture. A typical example is the multiparous woman with prolonged first and second stages of labour, who tires herself out with increasingly frequent contractions but without advance of the foetal head, the chief result being an increase in the volume of the bag of waters with each contraction and its slow subsidence afterwards. The two essentials of this problem are a presenting part which does not fit sufficiently tightly into the pelvis, and a tough bag of waters. Under these conditions the uterine contractions force *liquor amnii* past the foetal head into the bag of waters, and the head becomes the passive agent of an ineffectual ballottement, of an obstetric "pitch and toss" between the large bag of waters behind and the small bag in front. Immediately on artificial rupture of the bag this delaying counter-pressure is relieved, much surplus liquor behind the head escapes, and on resumption of uterine contractions the foetal head is driven well into the pelvis and cervix, and the process of labour is soon completed, perhaps within minutes.

Artificial Rupture of the Membranes.

The unique success that attends artificial rupture of the membranes in properly selected cases is the most cogent argument against the "essential importance" of the forewaters during labour. All evidence points to the foetal head as being a much more efficient cervical dilator than the bag of waters, as revealed in the almost universal shortening of labour following the application of this

method. At the same time the supposed ill-effects of "direct cervical pressure" on the foetal head following artificial rupture of the membranes are not borne out in practice, even in the most premature labours.

"Dry Labour."

If, then, we have so little evidence of the value of the bag of waters during labour, what of the supposed ill-effects of a "dry labour"? Have these, too, been overstated? Not to the same extent.

There can be no doubt that the woman who has been in labour for some days with liquor continually draining away is drifting into a condition potentially more dangerous than that of the patient in whom such drainage does not occur. The dangers of continual leakage are twofold—firstly, the increasing danger of endogenous infection when the amniotic sac remains open over a period of days, and secondly, the loss of the hydrostatic balancing effect of the bag of hindwaters, whereby the uterus is assisted evenly to relax and the uterine and placental circulations are helped to return to normal volume. With decreasing volume of the uterus during a long "dry labour", this hydrostatic effect is finally lost, more persistent retraction in the vascular areas becomes possible, and the stimulus of the irregular foetal parts on the diminishing uterus tends to excite more frequent and stronger contractions. Thus a vicious circle is set up, with the dangers of foetal asphyxia earlier and of tonic contraction of the uterus later.

Summed up, therefore, the position may be stated as follows. During pregnancy the importance of the amniotic sac of fluid as an exercise ground and protective covering for the foetus is not open to question. But, with the onset of labour and the division of the sac into forewaters and hindwaters, the position at once changes. The bag of waters in front of the presenting part is of no proven value in the mechanics of labour, and at times can be a definite hindrance.

The waters of undoubted value to the mother and baby during labour are the waters behind the presenting part, and their function is threefold: firstly, to distribute evenly the medianly and downwardly directed force of uterine contractions; secondly, to prevent direct and localized pressure of the uterine muscle on any part of the foetus; and lastly, to facilitate, by virtue of their hydrostatic incompressibility, the swift return of the uterine and placental circulations to maximal efficiency after contractions.

COMPARISON BETWEEN SURGICAL INDUCTION OF LABOUR BY MEANS OF THE RECTAL TUBE AND SURGICAL INDUCTION OF LABOUR BY ARTIFICIAL RUPTURE OF THE MEMBRANES: STATISTICAL SURVEY.¹

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For a number of years at the Women's Hospital, Melbourne, surgical induction of labour by means of the rectal tube and by artificial rupture of the membranes has been practised. In an endeavour to discover the more efficient method, a statistical survey of the results obtained by both methods has been carried out.

The survey covers a six-year period from January, 1938, to December, 1943, inclusive. Pregnancy had advanced to at least twenty-eight weeks in every case considered, and all cases in which either method was attempted have been included.

During this period there were 278 cases of tubal induction and 393 cases of artificial rupture of the membranes.

In an attempt to assess the relative value of the two methods, the following factors have been considered (i) the indication for induction of labour, (ii) the maternal mortality, (iii) the maternal morbidity, (iv) the foetal mortality, (v) the time from induction of labour to delivery.

Indications for Induction of Labour.

It will be seen from Table I in Dr. Saltz's paper that toxæmia was the indication for induction in 88% of the cases in which a rectal tube was used, and in 82% of those in which induction was by artificial rupture of membranes. As a result of this parallelism in the type of case in which each method of induction was used, the figures should be strictly comparable.

Maternal Mortality.

In this series seven maternal deaths followed tubal induction, a mortality rate of 2.5%, while only two deaths followed induction by artificial rupture of the membranes, a mortality rate of 0.5%.

Five of the deaths following tubal induction were due to infection, as follows: (i) an anaerobic streptococcal infection resulting in death on the twenty-ninth day of the puerperium; (ii) a *Clostridium welchii* infection, the patient dying undelivered; (iii) peritonitis, two patients dying on the second and nineteenth days of the puerperium; (iv) septicæmia due to the *Streptococcus hemolyticus* group A, the patient dying on the sixth day of the puerperium. The two remaining deaths that followed this method of induction were due to obstetric shock after normal deliveries; induction was for preeclampsia and toxæmic hypertension, and the times from induction to delivery were ninety-three hours and eighty-five hours respectively.

The two deaths following artificial rupture of the membranes were directly due to the primary disease; the first was that of a patient suffering from eclampsia who died sixty-three hours after delivery, while the second was that of a patient suffering from preeclampsia who died of acute pulmonary oedema one hour after delivery.

Maternal Morbidity.

The standard of morbidity used is elevation of temperature to 100.4° F. on two occasions from the second to the twenty-first days of the puerperium inclusive. On this standard it was found that the condition of 17.2% of the patients whose labour was induced by rectal tube became morbid during the puerperium, compared with that of 13.5% of those whose labour was induced by artificial rupture of the membranes.

Apart from the five deaths due to infection mentioned above, after tubal induction of labour two patients developed an anaerobic streptococcal septicæmia and one patient developed a severe anaerobic streptococcal infection not proved to be septicæmic. In addition to these there were three other patients whose period of morbidity varied from nine to sixteen days. Thus, amongst the patients whose labour was induced by rectal tube, there were five severe anaerobic infections, two of which were fatal.

No deaths from infection followed induction of labour by artificial rupture of the membranes. One patient developed an infection due to *Streptococcus hemolyticus* group A, but not septicæmic. The condition of five patients was morbid for periods varying from seven to fifteen days, the vaginal culture in each case yielding non-hemolytic streptococci and *Bacillus coli communis*. In two cases in which labour was induced by artificial rupture of the membranes after failure of tubal induction, anaerobic streptococcal infections developed, neither of which was fatal.

Thus the risk of severe infection following tubal induction of labour is much greater than that following artificial rupture of the membranes. The increased incidence of anaerobic infection after tubal induction is probably to be explained by the introduction of a foreign body into the uterine cavity through the vagina where anaerobic organisms are commonly found.

¹ Part of a symposium held by the obstetric staff of the Women's Hospital, Melbourne, on June 21, 1944.

Fœtal Mortality.

In the consideration of the fœtal mortality associated with the two methods, the duration of the pregnancy in each case is of considerable importance. The total fœtal mortality rate for tubal induction in this series is 37.2%, while the total fœtal mortality rate for artificial rupture of the membranes is 19.2%. From Table I it will be seen that the small number of patients between twenty-eight and thirty-two weeks pregnant whose labour was induced by artificial rupture of the membranes makes the figures of total fœtal mortality not quite comparable.

TABLE I.
Fœtal Mortality.

Method of Induction of Labour.	Duration of Pregnancy. (Weeks.)	Babies Born.	Number of Fœtal Deaths.
Rectal tube	28	31	26
	30	17	13
	32	38	22
	34	33	14
	36	58	15
	38	49	11
	40	64	7
Total	—	290	108
Artificial rupture of the membranes.	28	11	10
	30	9	8
	32	16	8
	34	45	21
	36	76	10
	38	87	10
	40	173	13
Total	—	417	80

This discrepancy may be overcome by dividing the cases into two groups, (i) under thirty-four weeks' gestation and (ii) thirty-four weeks' gestation and over. In the first group, tubal induction was attended by a fœtal mortality rate of 70% and artificial rupture of the membranes by a fœtal mortality rate of 72%; in the second group, tubal induction was attended by a fœtal mortality rate of 23.4% and artificial rupture of the membranes by a fœtal mortality rate of 14.1%.

Thus from thirty-four weeks' gestation onwards the fœtal mortality rate is considerably lower when labour is induced by artificial rupture of the membranes, while under thirty-four weeks' gestation there is no significant difference between the results of the two methods.

Time from Induction to Delivery.

The time from induction to delivery is of importance from the point of view of the primary condition demanding induction, and also as a factor influencing both maternal morbidity and fœtal mortality. This factor must be considered in relation to both maturity and parity (Table II).

TABLE II.
Time from Induction to Delivery in Relation to Duration of Pregnancy.

Method of Induction of Labour.	Duration of Pregnancy. (Weeks.)	Number of Cases.	Average Time from Induction of Labour to Delivery. (Hours.)
Rectal tube	28	30	25
	30	17	31
	32	36	35
	34	32	50
	36	55	45
	38	47	47
	40	61	49
Average time	—	—	42
Artificial rupture of the membranes.	28	12	31
	30	7	11
	32	19	19
	34	37	27
	36	72	23
	38	85	18
	40	171	17
Average time	—	—	20

It will be seen that at twenty-eight weeks' gestation the time from induction to delivery is more or less the same, tubal induction having a slight advantage. As pregnancy approaches term the time from induction to delivery gradually increases after tubal induction, while it decreases after artificial rupture of the membranes.

It may be argued that the greater number of *primigravida* whose labour was induced by rectal tube influenced the time factor. However, investigation of the time from induction to delivery in relation to parity does not bear this out (Table III).

TABLE III.
Time from Induction of Labour to Delivery in Relation to Parity.

Type of Surgical Induction.	Number of Pregnancy.	Number of Cases.	Average Time from Induction to Delivery. (Hours.)
Rectal tube	First.	169	47
	Second.	36	34
	Third.	20	24
	Fourth.	19	35
	Fifth.	7	45
	More than fifth.	27	26
Artificial rupture of the membranes.	First.	141	25
	Second.	73	19
	Third.	45	13
	Fourth.	44	14
	Fifth.	33	19
	More than fifth.	66	19

It will be observed that the time from induction to delivery after artificial rupture of the membranes is lower than that after tubal induction in all groups. The average time from induction to delivery after the insertion of a rectal tube is forty-two hours, while that after artificial rupture of the membranes is twenty hours. The longest time after tubal induction was 311 hours, while the longest time after artificial rupture of the membranes was 273 hours.

Other Points of Interest.

Other points of interest are as follows.

With regard to tubal induction, seven preeclamptic patients developed eclampsia in a total of 123 cases. Five inductions were unsuccessful, one patient being delivered by lower segment Cæsarean section, and four requiring subsequent artificial rupture of the membranes to induce labour. In one case prolapse of the umbilical cord occurred.

With regard to artificial rupture of the membranes, one preeclamptic patient developed eclampsia in a total of 126 cases; this suggests that the decrease in intrauterine tension reduces the severity of the toxæmia. Two inductions were unsuccessful; both patients were delivered by lower segment Cæsarean section. Prolapse of the umbilical cord occurred three times.

Summary.

This statistical survey indicates that the results of artificial rupture of the membranes are immeasurably superior to those of tubal induction, for the following reasons.

1. Maternal mortality and morbidity are lessened because of the reduced risk of severe infection, especially by anaerobic organisms.

2. From thirty-four weeks' gestation onwards the fœtal mortality is much less in spite of the risk of prolapse of the cord.

3. The time from induction to delivery is much shorter whatever the parity of the patient. At twenty-eight weeks' gestation there is little to choose between the two methods; but the time lag between induction and delivery steadily increases as pregnancy advances when tubal induction is employed, whereas when artificial rupture of the membranes is used the interval becomes progressively shorter.

THE BACTERIOLOGICAL DIAGNOSIS OF BACILLARY DYSENTERY BY MEANS OF RECTAL SWABS.

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AND

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THE value of rectal swabbings in the isolation of dysentery organisms has been reported in British and American literature, and this method has been applied to the detection of "carriers" in New Guinea. The procedure was found to be simple and rapid. Swabbings from about 80 men were taken and plates inoculated in an hour. The results were available forty-eight hours later.

In order to compare the efficiency of rectal swab examination with stool examination, it was decided to examine patients suffering from acute diarrhoea and to use both methods in parallel. At the same time it was hoped to throw some light on the aetiology of "common diarrhoea" in this area; this disorder we may define as diarrhoea in which neither blood nor mucus is detected in the stools. In such cases culture is seldom attempted, since experience has shown that the chances of isolating dysenteric organisms other than from mucus are very slender.

This preliminary work was carried out with the cooperation of an Australian general hospital. In the dysentery wards of this hospital, stools were examined by sisters and trained orderlies, who selected mucus and forwarded it to the laboratory in buffered glycerol saline solution. Experiments over a small number of cases have shown that such specimens keep satisfactorily for at least twenty-four hours. Culture was not attempted from stools containing no mucus.

One of us visited the hospital each day and collected rectal swabbings from all new patients admitted to the dysentery wards. The results in the 200 consecutive cases examined by both methods are given in Table I, which is divided into two parts. In the first 100 cases swabs were taken blindly through a rubber guard tube, while in the second 100 cases swabs were taken under vision through a proctoscope. One would expect the proctoscopic method to be preferable, and results bear this out.

There are several objections to this preliminary work, and three appear to be outstanding. Firstly, stools were examined at the hospital laboratory and swabs in the mobile laboratory; secondly, the same medium was not used throughout; and, thirdly, the selection of mucus from stools was outside laboratory control.

A few weeks later our laboratory staff was temporarily attached to the Australian general hospital, and the opportunity presented itself to repeat our work under more favourable conditions. It was arranged that stools from every new patient suffering from diarrhoea and admitted to the dysentery wards should be sent at once to the mobile laboratory, which was set up only a few yards distant. The laboratory staff decided whether further specimens were required or not. On the day of admission to hospital or the following day a rectal swabbing was obtained from each patient. At first there was considerable difficulty over stool specimens. These were not always sent to the laboratory, either because a positive swab result had already been obtained, or because no mucus appeared to be present. Such difficulties were eventually overcome; but there was the further complication that a patient suffering from mild diarrhoea, having been started on sulphaguanidine treatment as soon as he was admitted to hospital, often produced no stools for several days. Thus, from the 390 cases examined at this time, only 131 are suitable for comparative purposes, these being the only cases in which swabbings and stools were received by the laboratory at approximately the same time. Results from these 131 cases are set out in Table II and the following is an account of the technique used.

TABLE I.
Preliminary Series of 200 Cases.

Method of Swabbing.	Stool Examination.				Rectal Swab Examination.			Both Swab and Stool Cultures Positive.
	Stools with an Exudate.	Stools without Mucus.	Total Positive Cultures.	Positive Culture when Swab "Negative."	Total Positive Cultures.	"Negative."	Positive Culture when Stool "Negative."	
Blindly through rubber guard tube, 100 cases.	54	46	28 Shiga .. 15 Flexner .. 11 Schmitz .. 2	5 Shiga .. 3 Flexner .. 1 Schmitz .. 1	39 Shiga .. 14 Flexner .. 20 Schmitz .. 4 Shiga and Flexner .. 1	61	16 Shiga .. 2 Flexner .. 10 Schmitz .. 3 Shiga and Flexner .. 1	23 Shiga .. 12 Flexner .. 10 Schmitz .. 1
Under vision through proctoscope, 100 cases.	58	42	24 Shiga .. 17 Flexner .. 6 Schmitz .. 1	2 Both Shiga	47 Shiga .. 24 Flexner .. 21 Schmitz .. 2	53	25 Shiga .. 9 Flexner .. 15 Schmitz .. 1	22 Shiga .. 15 Flexner .. 6 Schmitz .. 1
Totals ..	112	88	52	7	86 ¹	114	41 ²	45

¹ This represents 93% of the 93 cases proven by culture.

² In 25 of these cases no mucus was detected in the stools; culture was therefore not attempted.

TABLE II.
Results in 131 Cases in which Stools Reached the Laboratory at about the Same Time as Rectal Swabs were Taken.

Typical Bacillary Exudate.	Stool Examination.				Rectal Swab Examination.			Both Swab and Stool Cultures Positive.
	Indefinite Exudate.	No Mucus.	Total Positive Cultures.	Positive Culture when Swab "Negative."	Negative Result.	Total Positive Cultures.	Positive Culture when Stool "Negative."	
51 (45 positive cultures).	58 (15 positive cultures and 3 cases of amoebic dysentery)	22	60 Flexner .. 52 Schmitz .. 6 Shiga .. 2	4 Flexner .. 3 Schmitz .. 1	57	74 ¹ Flexner .. 65 Schmitz .. 7 Shiga .. 2	18 ² Flexner .. 16 Schmitz .. 2	56 Flexner .. 49 Schmitz .. 5 Shiga .. 2

¹ Stools from 60 of the 78 cases associated with positive cultural findings yielded positive results on culture.

² In 10 of these cases no mucus was detected in the stools; no culture was therefore attempted.

Collection and Plating of Swabs.

Proctoscopy is performed with the patient in the "knee-chest" position. When mucus is present, this forms the most satisfactory specimen for culture. We believe that mucus can be found more frequently in this manner than in stools. If there is no mucus, the swab is rubbed firmly over the rectal wall, as high up as it is possible to see clearly, and care is taken to avoid obvious faecal material. If the rectum is full of liquid faeces, the patient is sent to stool and proctoscopy is repeated, or the rectum is mopped out with cotton wool. This precaution is necessary, otherwise an overgrowth of coliform organisms is likely to occur.

In the present series swabs were taken by six different people, including a sister who attended the female staff. Without doubt, the more carefully swabs are taken, the better will be the results. A swab plunged into a mass of brown faeces almost invariably gives negative results.

In the dysentery wards rectal swabbing is carried out by the physician in charge at a certain time each day. The "sigmoidoscopic room" of the ward is used, except for patients who are very ill; they are dealt with in their beds. Swabs are plated at once by a laboratory technician in attendance. We feel that this immediate plating is important, and it also saves time in both laboratory and ward. Swabs taken in other wards are sent to the laboratory as soon as possible.

A consideration of the proctoscopic appearances in relation to the obtaining of a positive culture in 100 consecutive cases in which swabs were taken by the same observer, showed that when mucus was present, either alone or mixed with faeces, 81% of the cultural examinations gave positive results, and when no mucus was seen, 15.5% of swabs gave positive results.

Culture Media.

Desoxycholate citrate agar was used for both stool and swab cultures throughout. In our preliminary series we were able to compare this medium with both SS agar and MacConkey media, although the number of cases was necessarily small. Sonne, Boyd (types I to III) and D19 strains have not been encountered; but Flexner, Schmitz and P274 strains grew well on all media. *Bacterium dysenteriae* Shiga is partly inhibited on both of the newer media; but we have encountered no instance in which a strain, growing on MacConkey, failed to grow on either desoxycholate or SS agar. It is considered that the Shiga organism is unlikely to be missed when either of the newer media is used; they are probably just as selective for Shiga as they are for Flexner, selectivity depending on suppression of coliform organisms.

The results obtained from 120 consecutive swabs plated on both desoxycholate and MacConkey agar are shown in Table III, which suggests a superiority of the desoxycholate medium. For stool culture we think that the difference may be less marked. In this examination it is possible to wash the inoculum (cellular mucus), and we are not dependent solely on the selective medium to prevent an overgrowth of coliform strains. In our experience all dysentery strains grow well on "Difco" MacConkey agar, which is an excellent medium, and we think that sparse dysentery colonies are easier to recognize on MacConkey medium than on either of the newer media.

Since adequate supplies of SS agar were not available, we had not a sufficient number of cases for a satisfactory comparison of this medium with desoxycholate. We felt, however, that though SS agar is more like MacConkey agar

to use, being free from unpleasant opacities after inoculation, it is rather less inhibitory to coliform strains than is desoxycholate. Thus it may be less selective for intestinal pathogens. Our Shiga strains grew no better on SS agar than they did on desoxycholate, being no larger than about pin-head size after twenty-four hours' incubation.

Bacteriological Technique.

Desoxycholate plates were examined early each morning and suspected colonies were fished into Kligler's iron agar slopes, the latter, for the sake of economy, being dispensed in test tubes measuring three inches by one-quarter inch. That evening, after seven or eight hours' growth, Kligler tubes showing a typical appearance were subcultured into mannite peptone water. The following morning growth on the Kligler slant was used for slide agglutination with appropriate antisera, and motility tests, if necessary, were performed on the fluid culture. Reports were therefore available in forty-eight hours.

When there was a profuse growth on the plate of colonies arousing suspicion, a slide agglutination test was made directly from desoxycholate agar and a tentative diagnosis could frequently be given in twenty-four hours. Colonies were then subcultured and confirmed as above. On only one occasion was it necessary to revise our tentative diagnosis.

Agglutination direct from desoxycholate agar may be slow, and the test cannot be performed with Shiga colonies which are small, slightly sticky and difficult to emulsify in saline solution. In MacConkey's agar Shiga strains grow rapidly, emulsify easily and are readily agglutinable. Growth on Kligler's medium appeared just as good for agglutination tests as growth on a plain agar slope. In all our listed cases, strains which did not agglutinate with the Commonwealth Serum Laboratories' sera were excluded.

Kligler slopes showing abundant gas production were discarded. When there was only a small amount of gas from glucose, the culture was tested with antiserum containing Flexner VI, in case the organism should be a Newcastle or Manchester bacillus; but we have rarely encountered these organisms in New Guinea, and none were detected in this series. It is possible that we have missed some. Paracolon strains giving these reactions are so common that the task of investigating them all would be monumental.

Kligler slopes showing the production of sulphuretted hydrogen were further investigated to exclude *Salmonella* strains; but we have never isolated a *Salmonella* organism from an acute dysentery-like condition in this area. Such strains are encountered in more prolonged, enteric-like fevers, and organisms which closely resemble *Salmonellas* are by no means uncommon in normal stools and in water. On one occasion such strains, which apparently belong to the paracolon group, were isolated from the stools of 15% of 120 healthy natives. Late fermentation of lactose with indole production or sucrose fermentation served to exclude them from the *Salmonella* group. Some such strains may be pathogenic, but since we cannot recognize the potential pathogens, it seems best to disregard the group.

Discussion.

In this area the presumptive diagnosis in all cases of acute diarrhoea, even when the attack is mild, is bacillary dysentery. It is therefore the policy to give sulphaguanidine in large doses to all patients as soon as they reach the ward, without waiting to confirm the diagnosis.

TABLE III.
A Comparison of the Results of Cultural Examination of Swabs on Desoxycholate and MacConkey Agar (120 Cases).

"Negative" on Both Media.	Total Positive Cultures.	"Positive" on Both Media.	"Positive" on Desoxycholate Only.	"Positive" on MacConkey Medium Only.
68	52	45	6	1
	Flexner 20	Flexner 16	Flexner 3	Flexner (one colony only)
	Shiga 29	Shiga 27	Shiga 2	
	Schmitz 2	Schmitz 2	Shiga and Flexner 1	
	Shiga and Flexner 1			

Thus all patients are treated promptly and effectively and spend a minimum of time in hospital.

Assistance in diagnosis in the ward is obtained by the macroscopic examination of stools for blood and mucus and by sigmoidoscopic examination.

Before further discussion on the results obtained with swabbings from the rectum, it is desired to point out that one of the most important functions of the laboratory is to confirm the clinical diagnosis of amœbic dysentery. In our experience it is unusual for this diagnosis to be made unexpectedly in the laboratory. Cases are suspected at the outset, or suspicion arises when sulphaguanidine has no effect on the diarrhoea. In the latter instance the chance of finding cysts, though perhaps not vegetative amœbæ, is quite as good as it was before the patient began to receive chemotherapy. In none of our amœbic cases was the patient ill enough for such delay in making the diagnosis to affect the prognosis seriously. It is possible that when a patient suffering from amœbic dysentery which is already subsiding is admitted to hospital the nature of the infection may not be recognized, since his response to sulphaguanidine would appear to be satisfactory. There were three cases of amœbic dysentery in our second series of 131 cases of diarrhoea, and this is approximately the proportion of amœbic cases we have encountered in New Guinea. This incidence is high rather than low.

Bacillary dysentery can be effectively diagnosed and treated without laboratory aid, which is fortunate, because laboratory facilities are not everywhere available. The chief function of the laboratory in bacillary dysentery is the determination of the pathogenic organism concerned. This is of epidemiological interest in focusing attention on scattered outbreaks, and is of help to the physician in assessing the prognosis, the probable duration of treatment and the arrangement of beds in his ward to help eliminate cross-infection. We believe that a laboratory report which does not give the nature of the pathogen, but merely a description of the cellular exudate, is of only limited value. Certainly if the exudate is typically bacillary, this provides good confirmation of the diagnosis of bacillary dysentery; but such confirmation is really unnecessary. More often the exudate is indefinite, which means very little, and in our experience the exudate in amœbic dysentery most frequently falls into this category.

We prefer therefore to judge laboratory methods for the diagnosis of bacillary dysentery by the number of cases bacteriologically proven. In Table II the total number of cases bacteriologically proved is 78, of which 74 were proved by examination of rectal swabbings alone, and only 60 cases were proved by stool culture. In Table I the difference is even greater; but we shall disregard these figures, because so many uncontrolled factors were concerned. It is interesting to note from Table I that virtually the same proportion of the total cases in which a positive culture was obtained (93%), were proved by swab examination alone.

The chief reason for this superiority of swab over stool culture lies in the fact that swab cultures may produce positive results when no mucus is found in the stool, so that stool culture is not attempted. In Table II there are 10 cases in which dysenteric organisms were isolated from rectal swabs, but no mucus was detected in stools examined at approximately the same time. In Table I there are many more such cases; but this is probably due to the fact that the ward staff were less diligent in their search for mucus than they might have been. For the series in Table II the whole stool was sent fresh to the laboratory, and mucus was detected more frequently, as is evidenced by the increased number of cases in which a dysenteric exudate was found, so that more stools were bacteriologically examined.

This advantage of swab over stool culture is actually greater than is shown by the foregoing figures. By means of rectal swabbings we obtain a specimen from all patients as early as possible in the disease. When sulphaguanidine therapy is instituted, in many of the milder cases the patients have no bowel action for several days, and by that time, even if the stool contains mucus, it is difficult to

obtain cultures from the stools. In many of these cases dysenteric organisms were isolated from swabs; but such cases are excluded from the tables because we were unable to make comparison with the results of stool culture.

The immediate administration of sulphaguanidine does not appreciably diminish the chance of isolating dysenteric organisms from either swab or stool on the day after the patient's admission to hospital, when 17.5 grammes of sulphaguanidine may have been given. However, "repeat" specimens, which are more readily obtained by swabs because bowel actions are less frequent, seldom yield positive results, so that by this time the drug may be exerting its full effect. We hope to work out this aspect more fully.

Our tables do not give a true indication of the proportion of cases of diarrhoea which may be bacteriologically proven, because so many of these patients when admitted to hospital have already been treated with sulphaguanidine in forward areas. Two small local outbreaks of diarrhoea in which patients generally were admitted to hospital early in the disease, before chemotherapy was instituted, will serve to show this incidence more accurately. In the first outbreak of 30 cases Flexner organisms were isolated in 25. From the 29 cases in the other outbreak we isolated dysenteric organisms in 25 (24 Flexner and 1 Shiga). In both outbreaks this represents diagnosis by rectal swabbing. The results from stool examination appeared inferior, but we did not obtain complete stool examinations for comparison.

Conclusions.

The purpose of this paper is to demonstrate the superiority of the rectal swab method over stool culture for the bacteriological diagnosis of bacillary dysentery under present conditions. We do not suggest that this method should replace stool examination for the investigation of dysentery when there is any likelihood that some cases may be amœbic, and for our own routine work we use both methods in parallel. Nevertheless, we think that, in the hands of experienced physicians, it would be safe and would effect a great saving in time to employ routine examination of rectal swabbings for the diagnosis of bacillary dysentery, using the laboratory examination of stools only when amœbic dysentery was suspected. By means of this routine it is possible, even when some 30 or 40 cultures are being examined each day, to fit the laboratory work comfortably into a morning. This allows more prompt attention and more time for the examination of suspected amœbic cases. Further, there is less handling of infected stools by orderlies and the patients themselves.

Finally, the rectal swab method is suitable as a test of bacteriological cure, if this is considered necessary, and for the examination of large groups of men in a search for "carriers".

Summary.

1. A technique of rectal swab culture for the detection of dysenteric organisms is described in detail.
2. It is suggested that the most necessary information to obtain from a laboratory in cases of bacillary dysentery is the nature of the pathogen, and not the cytological character of the stools.
3. A comparison is made between swab and stool culture for the detection of dysenteric organisms, and the superiority of swab culture in sulphaguanidine-treated cases is shown.
4. The simplicity and convenience of the method for the diagnosis of bacillary dysentery are pointed out.
5. Culture media are briefly discussed and desoxycholate citrate agar is considered the most suitable for rectal swab examination.
6. A warning is given that the diagnosis in amœbic dysentery depends on the microscopic examination of stools.

Acknowledgement.

Our thanks are due to the Director-General of Medical Services, Major-General S. R. Burston, for permission to publish this paper.

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A SIMPLE METHOD OF OBTAINING "ONE-WAY" VISION AND AUDITION.

By F. V. SMITH,
Sydney.

On many occasions when demonstrating the administration of tests and remedial measures for children with difficulties in reading and other school activities, I have felt that something would be gained if the children were less conscious of being observed. In the circumstances of 1941-1942, I felt obliged to seek a relatively inexpensive solution which is described below.

A comparatively long lecture room in the Teachers' College, Sydney, was partitioned as shown in the accompanying sketch plan (Figure I). The partitions

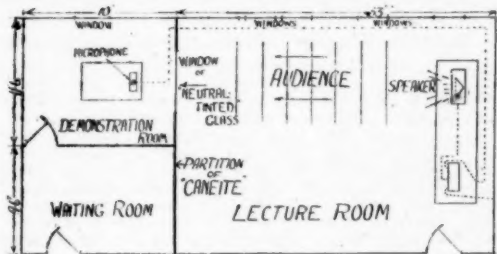


FIGURE I.

consisted of two layers of "Caneite". These sheets were nailed on either side of the upright hardwood struts of the partition, a cavity of about three inches being left between the two surfaces. I intended to have this space packed, but suitable packing was not available. A sheet of "neutral tinted" plate glass measuring four feet by two feet eight inches was inserted in the wall of the demonstration room. This glass is manufactured by Pilkington Brothers, St. Helens, Manchester, and was supplied by the O'Brien Glass Company, Sydney, who kindly lent samples of glass for preliminary tests. The sheet was the largest procurable in Australia at the time.

The floor of the demonstration room was raised nine inches. This measure allows observers to see what is done on the table in this room, and is a cheaper solution than raising the floor of the lecture room in tiers. The lower edge of this glass "window" was two feet three inches above the floor level of the demonstration room and three feet above the floor level of the lecture room.

If the lecture room is darkened and the natural light in the demonstration room assisted by the diffused light from an inverted bowl reflector, most effective "one-way" vision is obtained from the lecture room. Provided that the observer does not actually touch the glass and is not wearing any highly reflecting surfaces, such as jewellery or a white starched collar with a high sheen, he or she may stand as close as possible to the glass and be quite invisible from the demonstration room. Any form of wearing apparel is invisible when the wearer is a foot distant from the glass.

From the other side—that is, in the demonstration room—the "neutral tinted" plate glass provides a particularly faithful mirror for the speech subjects in particular, and for children with all other disabilities in which the use of a mirror is helpful. The darkening of the lecture room must permit of no chinks or bright bars of light. This condition was achieved by applying light wooden frames to the window sashes and fitting into them roller blinds made of "Sisalkraft", a tough reinforced paper-like material, much used in the recent emergency for "black-out" purposes. These blinds ensure a most effective dark room for lantern projection; they were actually one of the standard "black-out" fittings in this city. The walls of the whole suite were painted in a very light cream shade, which in the demonstration room ensures ample reflection of light.

The "one-way" sound effects were secured by a microphone concealed as part of the inkstand on the table in the demonstration room. The sound equipment was supplied by Philips Electrical Industries of Australia, Proprietary, Limited. The details are as follows: one dynamic type "American" microphone, standard amplifier (Philips) type 1210 with inverse feed-back and an output of 10 watts, standard speaker (Philips) type 130/820. The characteristic of the microphone is that it can be placed in a vertical position and pick up effectively sounds coming from any angle and from any part of the room.

After a brief period of experimentation with carpets and furniture in various positions, the reproduction was amazingly life-like. The sound of pencil on paper and the quick intake of breath are faithfully reproduced. No echoes or reverberations of any kind re-enter the demonstration room. Observers in the lecture room may discuss the case freely. Sufficient light suffuses through the glass from the demonstration room to ensure comfortable visibility in the lecture room and thus permit people to recognize one another and move about if necessary. Both waiting room and demonstration room are furnished and decorated in a manner attractive to children.

The equipment has now been in constant use for more than a year and has proved satisfactory in every way; no subject has ever appeared to suspect the situation. It is particularly helpful in securing a uniform presentation of the Rorschach test and the different forms of the Binet test in which the personal and variable element can be so disturbing. Much spontaneous behaviour has been observed—a feature which is often lacking in demonstrations in which children in varying degrees are aware of an audience. The situation would also permit of the making of recordings or sound films. If it was arranged that the observation "window" formed part of a book or instrument case, a situation helpful in psychiatric studies could be achieved.

Reviews.

RECENT PROGRESS IN PSYCHIATRY.

PSYCHIATRY is on the march, and "progress" is emblazoned on its banners. This can scarcely be doubted by anyone who reads the January number of *The Journal of Mental Science*, issued as "Recent Progress in Psychiatry", under the general editorship of G. W. T. H. Fleming.

This compendium of recent psychiatric advances contains twenty-seven articles by British psychiatrists, covering the work done in the whole field of psychological medicine within the last five years. Its editor entertains the hope, which will, doubtless, be shared by many readers, that it will become a quinquennial publication, for he realizes that in post-war development there is likely to be an ever-growing demand on the mental health services, and he foresees a period of rich expansion and fertile development.

¹ "The Journal of Mental Science", by authority of the Royal Medico-Psychological Association. Managing editor: G. W. T. H. Fleming, in collaboration with Alexander Walk and others. London: J. and A. Churchill, Limited. 9" x 6", pp. 511. Price: 30s. net.

in this aspect of medicine, to which child guidance and criminology have established ancillary relationships.

That psychiatry is becoming orientated among the cognate sciences is evident from a perusal of the present volume which contains chapters on the anatomy and physiology of the nervous system together with dissertations on endocrine and vitamin relationships, encephalographic studies and genetics. The newer forms of treatment are fully discussed with the latest refinements of technique and suggested modifications which are at present on trial. "Neuropathology", the "Psychiatric Aspects of Head Injury" and the "Psychopathic Personality" are among the important chapters; and those on delinquency and crime and the legal aspects of psychiatry bring these controversial subjects up to date. Psychometry is assuming a place of increasing importance in the assessment and elucidation of mental disorders; and research work in physiological psychiatry is helping to bridge the somewhat unnatural gulf between neurology and its sister science.

The direction of present-day research is indicated in all aspects of the subject. Some new ideas have been put forward with the confidence of general acceptance, but many are frankly empirical and tentative. Even the darker recesses of psychiatry have been illuminated—if not always with the white light of fact, at least with the suggestive flash of speculation—so that it seems not unlikely that future investigators may be led nearer to the kernel of truth. There is, indeed, in these essays an inspirational stimulus, a fund of concentrated knowledge and a provocative challenge to the medical man who has chosen psychiatry for his avocation and adventure in the realm of medicine.

This is no Barmecide feast, but a collection of substantial dishes, not for the tiro's palate, but for the stouter stomach of the seasoned psychiatrist.

REGIONAL ANÆSTHESIA.

AN English surgeon, H. W. L. Molesworth, has produced an interesting little book of 86 pages, principally concerned with induction of analgesia by blocking of nerve supply at a distance from the field of operation.¹ He wishes it to be regarded as a presentation of personal experience, not as a text-book. Using the methods described, he has performed a large number of operations, but especially gastric operations. He mentions a consecutive run of 115 resections for ulcer with two deaths, 24 resections for gastro-jejunal ulcer with five deaths, and 13 resections for carcinoma with seven deaths. On the other hand, he has practically nothing to say about operations on the gall-bladder, and he has removed a carcinomatous breast on two occasions. The presentation of personal experience is one of successful experience, and one to encourage others to go and do likewise. It is a good record, and it reveals an open and observant mind, and a very sound surgeon.

The methods described do not fill up all the useful possibilities of injection technique. They are designed almost exclusively for the induction of analgesia without reference to hæmorrhage control, and for its induction by certain methods. There are other useful injection methods, not necessarily alternatives to these, but collateral. We can regard the technique of local anæsthesia as part of the operation. We are able, if we choose, to influence very greatly the amount of capillary bleeding. We can do this if we use infiltration methods, using adrenaline, the "physiological tourniquet", in dilutions of one in 200,000 to one in 100,000, or in some circumstances a little more. Infiltration provides also the method of terminal anæsthesia, permitting the free use of more dilute solutions of the analgesic drug. However, if we like to use these methods ourselves, we need not impose them on everyone. If the surgeon prefers it, he can manage without, as Molesworth does, over an important range of surgery.

We change to intolerance in regard to certain special methods. We think Molesworth would do well to reconsider his recommendation of paravertebral injections. He has failed to give sufficient attention to reports of the over-frequent occurrence of collapse after these injections, from the cervical region downwards. Braun, in the seventh

(1925) edition of his book "*Die örtliche Betäubung*", abandoned the cervical injection because of its bad record, and that bad record has been confirmed in Australia. Moreover, it can be easily spared.

In regard to Kappis's posterior splanchnic injection, we cannot afford to pass over de Takáts's analysis of 2,475 recorded cases published in *Surgery, Gynecology and Obstetrics* in April, 1927; this showed eight deaths, two of which were not fairly attributable to the method. If these two are omitted, the analysis shows a death rate of one in 412, or 24 in 10,000. There was a collapse rate of one in 179, or 56 in 10,000. The death rate in this analysis compares very badly with the death rate from chloroform, as found in the Report of the Anæsthetics Committee of the British Medical Association (*The Lancet*, January 26, 1901); here the deaths were recorded as 18 in 13,393 administrations, which is one in 744, or thirteen in 10,000—a result twice as good as that of posterior splanchnic anæsthesia. And that was the worst fatality incidence recorded in any large series of chloroform administrations. Saint Bartholomew's Hospital could record 22,219 administrations with fourteen deaths (see *British Medical Journal*, November 20, 1897); this is one in 1,587, or six in 10,000, a result four times as good as that achieved by the Kappis injection. We consider that no method of anæsthesia, general, local or spinal, should be sanctioned, except in special cases, if its dangers are greater than those which have caused chloroform to fall out of general use. Should we go back to chloroform as superior?

These criticisms may seem rather lengthy, since they are criticisms of only a small part of the book, but they are not to be avoided if a review is to carry out its proper function. For the rest, we have hopes that this little book will serve to arouse more interest in local anæsthesia, and that it will stimulate more surgeons to gain, and emulate, the experience that has been so useful and so interesting to its author.

ADVENTURES IN NORTH QUEENSLAND.

IN her book "*By Tropic Sea and Jungle*" Jean Devanny presents a vivid and colourful account of her travels in North Queensland.¹ The book ranges over a wide variety of aspects of life in that vast area, from the doings of the fishermen and lugger boys on the Barrier Reef to those of the miners in the ridges, from the domestic activities of "Mr. and Mrs. Uca" (the fiddler crabs) to the habits of "Fascist ants and others". There are also a number of shrewd observations on timber. The most striking feature of the book is the author's extraordinary knack of ferreting out interesting information about their daily work from the people with whom she mingles. She usually permits them to tell their stories in their own words, with little adornment from her pen, and unshorn of the narrators' tricks of phrase and humorous touches. By this means the reader soon feels that he, too, knows Mac, Swannie and the others.

Members of the medical profession will be interested to find a chapter on "Snakebite and Snake Yarns", wherein mention is made of the "Symposium on Snakebite" of Dr. C. H. Kellaway and his associates at the Walter and Eliza Hall Institute, Melbourne, and of an article by Dr. H. Flecker, entitled "Snake Bite in Practice", which was published in this journal on July 6, 1940.

Miss Devanny spent some time in a rough hut in the ridges, and one of her objects was to make a study of the native insects, birds and animals and to collect specimens to be sent south. Her observations on the habits of these denizens of the forest among whom she lived make interesting and amusing reading.

This book makes no pretence to be more than a collection of anecdotes interspersed with interpretations of the author's own observations. Up to this point it may be said to lack form—and yet its very lack of conformity to a conventional framework is admirably adapted to its subject matter. It reveals the author to be the possessor of keen observation, human sympathy, a ready wit and a facile pen, and it should be read with pleasure and profit by all Australians who wish to know more of their own country, as well as by others who are interested in travel and adventure in a strange land.

¹ "Regional Analgesia", by H. W. L. Molesworth, F.R.C.S. (England); 1944. London: H. K. Lewis and Company, Limited. 8½" x 5", pp. 86, with many illustrations. Price: 8s. 6d. net.

¹ "By Tropic Sea and Jungle: Adventures in North Queensland", by Jean Devanny; 1944. Sydney: Angus and Robertson, Limited. 8½" x 5½", pp. 238. Price: 7s. 6d.

The Medical Journal of Australia

SATURDAY, OCTOBER 21, 1944.

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SPOON-FEEDING AND THE SPOON-FED.

BABIES are more helpless at birth than the offspring of any other mammal, yet most of them, before they have led an independent existence for very long, are able to take nourishment from the mother's breast in the usual way. As development proceeds they learn to feed themselves when food is prepared and put before them. Movements are at first uncoordinated, but this state of affairs soon passes, and if the child's attention is not drawn away from the business in hand, progress as a rule is rapid. Some babies at birth are unable to take the breast—they may have some abnormal condition such as cleft palate that will not allow them to suck; there may be some fault in the mother and in her handling of the child; the child may from time to time appear to be lazy. In these circumstances spoon-feeding is started. For the child spoon-feeding is easy; in the early days fluids only are presented on the spoon and all that the child has to do is to swallow, and even when solids are added later on they are generally finely divided and not much added exertion is needed. For the mother or nurse a period of spoon-feeding is one of added responsibility and involves the expenditure of much time. Since spoon-feeding is not a normal procedure, it cannot be expected that while the expedient has to be adopted the development of the child in every aspect of its life will proceed along normal lines—even if all the bodily needs of the child are met, some defect of behaviour or of character may become apparent. It may therefore be concluded that any departure from normal methods of feeding is to be deprecated, and that if any departure is necessary, it should be of as short a duration as possible.

But spoon-feeding is not used only to sustain the bodies of infants. As children grow, their minds have to be fed as well, and even when they are no longer children the feeding of their minds may be difficult. Spoon-feeding of the mind opens up the whole question of education. The word education signifies from its Latin derivation a

process of leading out, of development of latent qualities by another person. It is an active process. In a proper system of education the dormant mind of the child is aroused; it is taught to think, and as development proceeds thinking becomes more and more a matter of the will and of personal adventure. The mind cannot develop, the child cannot be taught to think unless it receives a stimulus from without, from the teacher. The development of the child's mind will depend on the way in which the mental pabulum is chosen, prepared and given. The analogy with the food of the body is practically complete. To withhold food or to give unsuitable food will retard mental development; to give too much food, whether it is suitable or not, will throw the developmental process out of order. It cannot be insisted too strongly that the way in which mental food is presented to a child (and to an adult, too, for that matter) is of the greatest importance. Children vary in the attention that they pay to food of this kind and in the avidity with which they consume it. But whether they naturally pay attention to it or not, it must be made to appear attractive and interesting. In proportion as this is done, so will the powers of absorption and utilization become more effective. If spoon-feeding of the mind has to be started, it must be looked on as only a temporary measure, and should be terminated as soon as possible. There is a world of difference between education and instruction, and mental spoon-feeding is something like a peptonized form of instruction. Children who are mentally retarded have to be spoon-fed, and the process has to be continued indefinitely. Unfortunately this process is used for many who are not mentally deficient, and the laziness that it engenders is apt to remain in after life as a permanent attribute of the person concerned. We have only to look around us to realize that many persons in the community are prepared to swallow without question views prepared for them by designing and interested people. These people generally suggest that the person concerned is being "got at", and their words are likely to be clothed in a class-conscious garment and heralded by a political catch-cri. To accept the views presented requires little effort—swallowing is really a reflex phenomenon. It is not only from politics that mental pap for the multitude is obtained; almost every field of human interest may be drawn upon for this commodity. It has been said that the spread of democracy may mean cultural decline. This saying cannot be looked on as accurate. It is not democracy as such that may give rise to mental inertia, but the state of affairs which democracy as we know it tends to bring. Chief among these tendencies is the growing feeling that the individual need not exert himself a great deal on his own behalf. If he drifts with the crowd and takes life as it comes it does not, he believes, matter much whether he bestirs himself and makes a success of his life. There is always an old-age pension, or the dole. In many respects it is the old question of bread and circuses over again. The absence of responsibility either for personal welfare or for the welfare of the State is one of the most deplorable features of our present-day existence. We are becoming a nation of people among whom the spoon-fed predominate. The present-day tendency to be content with prepared and preselected mental papulum, it may be objected, is not always consequent on a failure in education; the rush and hurry of life may be held responsible in many instances. This will be admitted, but in these circumstances laziness

or weariness may be to blame. Weariness should not be allowed to come between man and his intellectual life; a life is not properly ordered in which no provision is made for recreation and recuperation. Laziness may be a legacy of childhood or of much more recent origin, but in either case it is reprehensible. It may also then be contended that if education has been conducted as it should be man will so order his life that neither weariness nor laziness will get the better of him. Thus we are back again where we started.

To combat the present attitude of uncritical acceptance of ready-made opinions and doctrines by a complacent community it will be necessary to remodel the education of children in their earliest years. As children grow in years their mental well-being must be the care of adults in the community who have inquiring minds and an independent spirit. How this will be possible is not clear, but direction will be just as necessary as effort by the growing members of society. People are asking for more education, but they do not know what they want to be taught, and few of them know that education is a matter of constant striving towards a goal that is never reached. A love of books is one of the safeguards against backsliding; but there is an art in reading, in the choice of books, that the mind be kept supple and able to comprehend the more profound works in literature. The author of the Epistle to the Hebrews summed the matter up when he wrote:

For everyone that useth milk is unskilful in the word of righteousness: for he is a babe.

But strong meat belongeth to them that are of full age, even those who by reason of use have their senses exercised to discern both good and evil.

Current Comment.

THE RELATIONSHIP OF ANÆMIA WITH INFECTIONS.

It is well known that many varieties of infectious diseases bring anemia in their train. The factor of age may be significant; infants and young children have been observed to suffer considerable fall in their hæmoglobin value after even such apparently mild infections as nasal catarrh. Where blood destruction occurs, of course, one mechanism is evident, as in the case of malaria, though the deficiency is usually soon made good. But in other conditions no such explanation is valid, and even where the infection is prolonged or chronic we have little knowledge of the process at work. M. F. Saifi and Janet M. Vaughan have published a study of the pathology of the anemia associated with infection, which throws considerable light on this question.¹ They observed the peripheral blood picture over varying periods in patients suffering from mild infections such as furunculosis, more intense acute infections, and subacute and chronic infections lasting more than three months. Patients receiving more than one gramme of a sulphonamide drug were excluded, owing to the known occasional effect of these drugs on blood formation. The numbers of cases studied in the various groups were 10, 20 and 14. In eight cases autopsies were made, with full investigation of the hæmopoietic tissues. An assessment was made of the percentage of the amount and degree of cellularity of the red marrow in the skeleton, a method previously employed by Turnbull being used as a normal control. Full blood examinations were made at appropriate intervals. Anæmia

was not considered to exist unless the hæmoglobin level was below 80%; 2% was taken as a normal reticulocyte count and 1.3 milligrammes per 100 cubic centimetres as a normal upper limit of the plasma bilirubin.

The results show that mild infections had no effect in producing anæmia in adults. The anæmia in severe infections was normocytic and orthochromic in type, though some slight reduction in size and pigment capacity of the red cells was sometimes seen. The three possibilities of causation are aplasia of the bone marrow, increased blood destruction and deficient blood production. Saifi and Vaughan conclude that there is no evidence of marrow aplasia, even after allowing for the predominance in most cases of leucopenia expected in cases of infection. Likewise they find no definite evidence of an increase in blood destruction, though they are not prepared to deny it altogether. Occasionally a complicating jaundice may disturb the blood chemistry, as in pneumonia, but apart from hepatitis as a pathological entity there is usually no significant increase in the plasma bilirubin content or in the urobilinogen excretion. It is rather to a failure of blood production that we must look to explain the anæmia of infections. Saifi and Vaughan noted especially the absence of mature red cells from the marrow, in spite of the erythroblastic activity seen. They believe that maturation arrest occurs at the point where the fully developed blast cell loses its nucleus and becomes the peripheral type of red cell. In deficiency anæmias lack of some essential principle will cause this arrest of maturation, and we further know that none of the known blood-forming principles act in the presence of infection. Even in the laboratory animal iron, though absorbed, is not utilized during an infection.

These authors suggest, then, that infection in some way interferes with the synthesis of hæmoglobin resulting in maturation arrest in the marrow. It would appear that fruitful studies could still be made on these types of anæmia, some of those often called "simple" for the purposes of classification, though the name is perhaps not truly apt from the point of view of the pathologist.

MENINGITIS DUE TO ORGANISMS OF THE SALMONELLA GROUP.

When the more modern nomenclature was introduced into bacteriology, the significance of the severance of the typhoid group from the so-called paratyphoids was perhaps not clearly recognized by clinicians. Accustomed to regard paratyphoid fever as closely related to typhoid fever, which in many ways it is from the clinical point of view, they hardly realized the importance of the genus *Salmonella*, in which the paratyphoid bacilli are now included. The variety of symptoms that may be caused by salmonella infections is very great; this makes it difficult to have in the mind's eye one of those nicely defined syndromes that so assist memory. E. R. Neter in a report of a case of meningitis due to *salmonella suispestifer* classifies salmonella infections into three groups, paratyphoid, gastro-enteritis and pyogenic infections.¹ The last group comprises septicæmia, peritonitis, osteomyelitis, pharyngitis, otitis, empyema, pyelonephritis, meningitis, and a number of other inflammatory processes. During the last few years experiences in the armed forces have freshened interest in the salmonellas, as has also a realization of the epidemic potentialities of gastro-enteritis in the civilian population, for example, among young children and even among newborn infants. Neter states that 78 cases of salmonella meningitis are recorded in the literature, though only four could be found in which the infecting organism was proved to be the *suispestifer* or *cholerae suis* variety.

Neter's own case was that of a little girl, nearly four years of age, who was found to be wildly delirious, with a high temperature. There were the usual signs of severe meningeal irritation, and lumbar puncture produced turbid

¹ The Journal of Pathology and Bacteriology, April, 1944.

¹ Archives of Internal Medicine, May, 1944.

fluid under high pressure, from which Gram-negative organisms was obtained. The organism was identified at the New York Salmonella Centre as *Salmonella cholerae suis*. The disease was rapidly fatal and did not respond to sulphadiazine. No source of the infection could be discovered. Of the five cases now reported of this type of meningitis, all were fatal but one, and it is curious that in this case anti-meningococcal serum was used in treatment, no doubt an irrelevant observation. Neter, in reviewing the literature, concludes that the blood stream is invaded, probably from the intestinal tract, and points out that definite inflammatory lesions were found *post mortem* in the intestinal tract of his patient. There is, of course, no significant bulk of evidence as to the value of any treatment, but the sulphonamide compounds, though variable in their effects on this varied bacterial genus, would naturally be employed.

Such an uncommon type of illness perhaps may be thought a rather academic subject, but it serves to draw attention to the importance of this type of bacterial invader. M. L. Levine and E. B. Plattner have recently recorded three cases of pneumonia due to *Salmonella supestifer*.¹ These were apparently all primary inasmuch as no intestinal involvement was detected. All these patients recovered rapidly following the administration of sulphathiazole. No meningeal symptoms were observed in any of these patients.

From the clinical point of view it is important to remember the value of blood culture in these infections, and where facilities exist the more extended use of this method would do much to clarify our knowledge. When we come to the recognition of the actual member of the bacterial group we meet a much more difficult problem. Only large central laboratories can cope with this fully, and indeed special interest in salmonellas is necessary as well as full facilities for maintaining a supply of diagnostic agglutinating sera. In a country like Australia organization is needed to make available such facilities, and it would seem to be ideal if certain highly specialized bacteriological procedures could, by arrangement and agreement with the authorities concerned, be recognized as a special branch of the activities of certain laboratories.

THE RADIO VOICE.

It is well recognized that in spite of the fact that the managers of radio stations cannot please everyone with their broadcasts, they nevertheless have an immense audience and, quite apart from any consideration of programmes, the problems raised by the transmission of the spoken voice have engaged their attention very deeply. T. B. Jobson chose for his presidential address to the Section of Otology of the Royal Society of Medicine the subject of "The Audibility of the Radio Voice".² He points out that not all radio speakers are gifted with clear enunciation and even some well-known people with experience of public speaking make their listeners strain to hear. Further difficulties are raised by the audience. Jobson remarks that a radio audience consists of all types, those of high education, those of poor education, the quick thinkers, and the slow thinkers, those with normal hearing and those with defective hearing. He quotes Wells who estimated the number of persons in England and Wales who had defective hearing in one or both ears as one in six of the total population, which means that in 1937 about 7,000,000 of the people in England and Wales were somewhat deaf. It is likely that many of these are comprised in the radio audiences. Even a slight degree of deafness is a handicap because the listener has to strain to concentrate and soon fatigue steps in and prevents continuous perception and apprehension of the spoken word. Jobson also points out that the time lag in the interpretation of sounds, which is by no means uncommon, especially in

middle-aged and old people, is an important bar to accurate hearing. He assumes that this time lag begins to manifest itself about the age of fifty, and as the population figures for persons over fifty in 1938 were over 10,000,000, it will appear that a very large number of interested listeners to radio have a delay in aural interpretation. Of course, this is not the only factor with those whose hearing is defective, for the diminution in acuity of hearing is more marked in the higher tones, especially those over a thousand cycles, although these are well above the speech range.

In the discussion V. E. Negus and E. P. Fowler enlarged upon this question of the vibration range of radio reception and pointed out that the most important parts of the pitch were from 500 to 4,000 or even the more restricted range of 800 to 2,500 or 3,000 vibrations per second. Fowler expressed the opinion that if a broadcast receiver delivers only those frequencies between 1,000 and 3,000, about 80% of intelligibility should be achieved. He pointed out further that actual measurements had proved that good clear speakers were careful not to drop their voices at the end of a phrase or sentence and were particularly careful about certain words, especially those containing the consonants s, t, th. The various speakers seemed to agree that the greater audibility to most persons of the male voice on the radio as compared with the female voice was explained by the predominance of the lower tones, which does not mean only fundamental tones, but also important overtones. The interest of the discussion was enhanced by the participation of Mr. John Snagge of the British Broadcasting Corporation. He pointed out that many factors were involved in audibility and appreciation of transmitted speech. Most of us will agree with him when he says that the microphone and loud speaker are not kind and that they tell us truth sometimes unpleasantly; but it is the business of the broadcaster that speech shall not only be transmitted well technically, but that it shall be of such acoustic quality as to reach the intelligence as well as the ears of its hearers. He dealt with the question of speed interestingly and remarked that Mr. Churchill, in speaking on the dramatic occasion of the fall of France, averaged 400 words in three minutes. It is curious to learn that the Foreign Secretary on another occasion spoke 385 words in three minutes with average pauses, whereas the same speaker addressing a large audience in the Royal Albert Hall only attained the rate of 100 words a minute. This rate was no doubt conditioned by visual impressions of its reception, but those who know the Albert Hall will doubt if the test is a fair one. Mr. Snagge said that radio audiences differed from those who could see the speaker, inasmuch as they did not wish to have a speech made to them in their homes. It is very interesting to know that a year or so ago the British Broadcasting Corporation was informed by many listeners that the midnight news was always read too fast, although investigation showed that the rate was precisely the same as at other times of the day. The reason obviously was that the listeners were fatigued, but a slightly slower rate of reading satisfied them.

All these considerations go to remind us that there are many factors concerned in the reception and appreciation of the spoken word. It would appear that the general public is becoming less sensitive to sound probably owing to an increasingly noisy environment of which radio broadcasting forms a definite part. It is a common experience to see a considerable number of persons in homes and in hospitals or in other public places cheerfully pursuing their occupations and even carrying on private conversations while a giant voice fruitlessly proclaims in their very ears. The teacher notices the same degree of inattention in scholars. Even the medical teacher notices this today, and no doubt hopes that the fault is not his. Perhaps this is in part true, for his students are drawn from a generation who often hear without listening, but it is necessary also to remember that a proper modulation of voice and clearness of articulation are prime necessities for anyone who wishes his words so to be winged that they will reach their mark. These qualities are, it is to be feared, not preeminently characteristic of Australian speech.

¹ American Journal of Clinical Pathology, June, 1944.

² The Proceedings of the Royal Society of Medicine, April, 1944.

Abstracts from Medical Literature.

PATHOLOGY.

Fluid Dynamics in Chronic Congestive Heart Failure.

ACCORDING to James V. Warren and Eugene A. Stead, junior (*Archives of Internal Medicine*, February, 1944), oedema develops in chronic congestive heart failure because the kidneys do not excrete salt and water in a normal manner. This disturbance in renal function is related to the decreased cardiac output and not to engorgement of the kidneys from an increased venous pressure, because the salt and water retention may occur before there is a rise in venous pressure. The increase in the plasma volume is a manifestation of the retention of salt and water. The resulting decrease in concentration of the plasma proteins usually stimulates production of plasma protein so that the total amount of circulating protein increases. The plasma volume is thus increased in size without a pronounced lowering of the osmotic pressure of the plasma proteins. In due time the increase in the blood volume and the extracellular fluid volume causes a rise in the venous pressure. The osmotic pressure of the plasma proteins and the increased pressure of the extracellular fluid provide the physical forces which enable the large plasma volume to be maintained in the presence of the high capillary pressure which results from the high venous pressure. Local differences in venous pressure are of importance, in that they determine the placement of the salt and water which are retained by the kidneys in congestive heart failure. Other factors than retention of salt by the kidneys account for the rise in venous pressure in acute heart failure. In many patients the rise in venous pressure represents the summation of the effects of acute and chronic heart failure.

Lateral Aberrant Thyroid: Metastasis to the Lymph Nodes from Primary Carcinoma of the Thyroid Gland.

RICHARD C. CLAY AND S. BLACKMAN, JUNIOR (*Archives of Surgery*, March, 1944), have studied two examples of the condition which has repeatedly been described in the medical literature during the past forty years as "lateral aberrant cervical thyroid". In both cases the lateral cervical masses were found to be metastases in lymph nodes, while the primary tumour in each case was found in the homolateral lobe of the thyroid gland. In one case the primary tumour was palpable only at operation, nineteen months after removal of the first metastases in cervical lymph nodes. In the other case three cervical metastases were removed at a time when no tumour was recognized in the exposed thyroid at operation. Six years later, however, another cervical metastasis was found, and the primary tumour in the homolateral lobe of the thyroid was then about four centimetres in diameter. In this case small foci of papillary cystadenocarcinoma were present in the opposite lobe of the thyroid as well. Evidence from the literature and

from the two additional cases indicates that the lesions long known as "lateral aberrant cervical thyroid" should be interpreted, until satisfactory evidence to the contrary is adduced, as tumour metastases in cervical lymph nodes from small primary carcinomata in the homolateral lobe of the thyroid. When such a lesion is found in the lateral cervical region, the thyroid should be explored and at least the homolateral lobe should be removed, whether the primary tumour is palpable or not. The tumour may be present in both lobes of the thyroid, and if only one lobe is removed the patient should be watched for the subsequent appearance of lesions in the opposite lobe. The spread of metastases to lungs, bones and other sites may be relatively slow, and this particular tumour seems therefore to represent one type of carcinoma in which there is reason to believe that the disease may be cured by surgical removal of the primary lesion and the first metastases. The microscopic appearance, according to the authors, is not a good index of malignancy, since metastases develop which histologically appear benign.

Myelin Staining by a Fixed Schedule for the Occasional User.

R. D. LILLIE (*Archives of Pathology*, June, 1944) has studied acceptable routine staining of myelin which may be attained with fixed times, temperatures and solution concentrations by means of a variant of Well's modification of the Weigert myelin stain. Material fixed in dilute aqueous formaldehyde solution and not over six months old, according to the author, should be mordanted for two to four days in 5% potassium dichromate solution before dehydration. Chromation of paraffin sections of material fixed in formaldehyde is futile. In this material the coarser myelin bundles can be stained without chromation, and no amount of mordanting restores the fine fibres. Material stored for longer than six months in dilute formaldehyde solutions shows a gradual impairment of myelin staining until in three or more years satisfactory stains are unobtainable by any variant tried. Prolonged chromation, whether in the block or on the slide, impairs first the staining of chromatin and tigroid and then that of myelin as well. Weigert's potassium dichromate-chromium fluoride stain is more harmful in this respect than 5% potassium dichromate solution. The following staining schedule is suggested: (i) Stain for forty minutes at 55° C. in iron alum-haematoxylin (equal parts of one to five day old 1% alcoholic haematoxylin solution and 4% iron alum solution); wash in water. (ii) Differentiate for one hour in 0.5% iron alum solution; wash in water. (iii) Treat for ten minutes in an aqueous solution containing sodium borate solution (1%) and potassium ferricyanide solution (2.5%); wash in water. (iv) Counterstain for five minutes in 1:1,000 safranin O in 1% strength acetic acid; wash in water. (v) Dehydrate, clear and mount.

Clinicopathological Studies of Renal Damage due to Sulphonamide Compounds.

FRANCIS D. MURPHY, JOSEPH F. KUZMA, THEODORE Z. POLLEY AND JOHN GRILL (*Archives of Internal Medicine*, June,

1944) present a study of clinical and pathological data in 14 cases of renal insufficiency due to intoxication with sulphonamide compounds. Thirteen of the 14 patients died and were studied *post mortem*. Decapsulation of the kidney was performed and a biopsy specimen taken in the case of one patient who recovered. Most of the commonly used sulphonamide compounds were employed, but sulphathiazole was the most commonly used. The primary disease under treatment was considered to play no part, or at any rate a small role, in causing the renal damage. Although five of the 14 patients treated had slight evidence of some renal involvement before therapy was begun, this was not considered a contraindication to the use of sulphonamide compounds, as these drugs have been used successfully in the treatment of acute nephritis. The quantity of the sulphonamide compound administered and the drug level in the blood appeared to be unimportant in producing the renal damage. As much as 41 grammes and as little as 10 grains (0.6 gramme) were responsible for fatal renal injury. In a few of the cases deposits of crystals of the drugs in the urinary tract causing some degree of mechanical obstruction were found associated with the nephrotoxic lesion; but this was not the rule, as in most of the cases reported the nephrotoxic lesion was independent of mechanical blocking. Histologically, simple tubular degeneration was present in all the kidneys, regardless of what other changes had occurred. Advanced tubular degeneration, necrosis of the tubular cells and intense inflammatory reaction outside the nephron in the surrounding tissues occurred in some cases. These various tubular lesions undoubtedly represent degrees in the severity of one process rather than different kinds of response. In one case advanced changes in the glomeruli are reported. No correlation between the clinical features and the specific site of the renal tubular damage was determined in this study.

Foam Cell Plaques in the Intima of Irradiated Small Arteries.

ACCORDING to John F. Sheehan (*Archives of Pathology*, May, 1944) an uncommon, or at least a rarely described, lesion of small arteries (100 to 500 μ in external diameter) has been observed in several irradiated organs. The lesion consists of a plaque-like thickening of the intima due to a collection of foam cells alone or foam cells mixed with various other cells, fluid, fibrin or hyaline material between the endothelium and the internal elastic membrane. Pathological changes may be found in the adjacent internal elastic membrane, media and adventitia, but these structures are often normal. The plaque may cause considerable narrowing or even occlusion of the lumen of the vessel. Thrombosis, fibroblastic proliferation of the intima or deposition of elastic tissue in the thickened intima seldom results. These foam cell plaques have been found in the arteries of organs subjected to Röntgen therapy only, to radium therapy only or to both combined. The plaques probably result from migration into the intima from the blood stream of lymphocytes and monocytes and subsequent transformation of these into foam cells by their ingestion of lipids which have

been freed by the dissolution of red cells in the intima or which have accumulated in the intima after passage across portions of the endothelium rendered more permeable than normal by irradiation. The foam cell plaques in irradiated small arteries closely resemble the early lesion of atherosclerosis.

The Chemistry of Ovarian Cysts.

R. M. WATTS AND F. L. ADAIR (*American Journal of Obstetrics and Gynecology*, July, 1944) have made determinations of sodium, potassium, chloride, nitrogen, non-protein nitrogen, protein, glucose, total solid, water ash and specific gravity on 29 specimens of ovarian cyst fluid from 15 ovarian tumours (nine benign and six malignant); three specimens of fluid from parovarian cysts have been examined. Values vary greatly, not only among the fluids from different types of cysts, but also between the fluids from the different cavities of the same tumour. The findings are correlated with the histology of the tumour. The composition of the fluid seems to vary with the secretory activity of the lining of the cyst. In general, fluids from cysts with actively secreting epithelium and a cellular basal layer are rich in nitrogen and protein, rich in potassium and poor in chloride; those with less actively secreting epithelium, or a cyst wall which is denuded or attenuated, and in which the basal layer is avascular or hyalinized, are poor in nitrogen, protein and potassium and rich in chloride.

MORPHOLOGY.

Level of Termination of the Spinal Cord.

A. F. REIMANN AND B. J. ANSON (*The Anatomical Record*, January, 1944) state that, with the exception of a single specimen (sacral cord), their series of 129 adult specimens shows a range of variation in termination of the spinal cord from the lower third of the twelfth thoracic vertebra to the middle third of the third lumbar vertebra. The level of the mean is opposite the disk between the first and second lumbar vertebrae; 94% of the cords in the current series terminate within the territory of the upper two lumbar vertebrae. A compilation of 672 similar records from the literature shows a range from the middle of the twelfth thoracic vertebra to the lower third of the third lumbar vertebra. The point of greatest frequency of termination for this more inclusive group is the lower third of the first lumbar segment; in the interval between the upper third of the second lumbar and the lower third of the first lumbar levels the spinal cord terminates in 51.1% of the group. A case of sacral cord, with anterior sacral defect and *spina bifida occulta*, is described.

The Cerebral Cortex in a Very Old Brain.

W. RIESE AND I. S. ZFAS (*Archives of Neurology and Psychiatry*, January, 1944) describe the brain of a man, aged 107 years. The cytoarchitecture of this brain was well preserved and revealed the well-known regional

variations. The same held true for brains from subjects aged 87 and 91 years, also recently seen by the authors. This answers for the first time the question submitted by prominent brain anatomists as to the possible change of cytoarchitectural patterns in functions of old age. The gross and cellular pathological changes generally considered as characteristic of the senile brain were present to only a moderate degree. This is interesting, not only because of the advanced age of the patient, but because of the existence of a clinical picture of senile dementia for eleven years. Further, in this very old brain a notable tendency to repair (mesenchymal and glial) was also found, and even regeneration is indicated by the presence of binucleated ganglion cells and *plaques fibro-myeliniques*.

Interstitial Cells of the Testis.

C. W. HOOKER (*The American Journal of Anatomy*, January, 1944), after forty years of study, believes that the evidence that the testicular interstitial cells of Leydig are the site of production of male sex hormone, androgen, is for the most part unsatisfactory. The present investigation was conducted to ascertain whether the character of the interstitial cells of the testis bears any relation to changes in the testicular content of androgen itself during various phases of life, and the bull was selected, as its testicular androgen is adequate to permit quantitative assay. Up to two years, the Leydig cells progressively increased in number and in size, but after 2 years they became extensively vacuolated and greatly increased in number and in size. From five to fifteen years increasing loss of vacuolation and diminution in size of the cells occurred. In animals fifteen years old, numerous stages in the disintegration of the Leydig cells were seen. In correlation with these histological changes, it was found that the androgen content of these testes increased uniformly and slowly through the first two years, from two to five years it increased sharply to a high level and then from five to fifteen years it decreased. The most direct correlation was between the extent of the vacuolation of Leydig cells and the androgen content. Changes in size or structure of the tubules were not associated with changes in androgen level.

Genital Changes in Hyperthyroidism.

K. M. RICHTER (*The Journal of Morphology*, May, 1944) states that although numerous reports of a thyroid-gonad relation have been made, there is much divergence between the facts observed and the interpretations made relating to the precise nature of the effect of hyperthyroidism on gonadal structure and function in the sexually mature male animal. In the present communication he presents new facts and suggests a common footing for the diverging interpretations which at present surround the problem of genital structural and functional changes in hyperthyroidism. Three characteristic states of hyperthyroidism were induced in sexually mature male guinea-pigs by means of desiccated thyroid substance; and synthetic thyroxine. Each hyperthyroid state was accompanied by a characteristic involvement of a fairly constant number of

seminiferous tubules, which varied with the degree of hyperthyroidism per unit of time and with the duration of the hyperthyroid state. Tubule involvement invariably began at the hilus and progressed in an orderly, chronological sequence, generally along one side of the testis towards the *cauda epididymis*. Involved tubules were typified (a) by having reduced diameters, (b) by having reduced numbers of germ cells, especially mature sperms, although every cell germ present was in an active spermatogenic phase, and (c) by a total absence of cellular degeneration of the germinal epithelium. Hyperthyroidism, directly or indirectly, or in both ways, induces an increase in the functional activity of the mechanism for the discharge and transference of germinal products into and through the efferent genital ducts; this increase, if the degree of hyperthyroidism per unit of time is great enough and of sufficient duration, projects them into the urinary bladder and in addition may mechanically disorganize to some extent the seminiferous tubule epithelium. It is suggested that the alterations in seminiferous tubule structure and constituency of the germinal epithelium are to be interpreted as being due primarily to the joint action of two factors: (i) an imbalance of the normal physiological growth and differential spermatogenic processes resulting in a precocious maturation of the germ cells without a compensatory increase in the spermatogenic growth phase, and (ii) an increase in the rate of discharge and transference of germinal products through the efferent genital ducts.

Cytology of Human Placenta.

B. L. BAKER *et alii* (*The American Journal of Anatomy*, May, 1944) present the results of an extensive investigation into the cytology of the placenta in an attempt to find structures within the villi and nearby *decidua parietalis* to which it might be possible to attribute an endocrine function. Pieces of chorionic villus and *decidua parietalis* were obtained during various stages of pregnancy (43 cases) and studied with a variety of techniques. Evidence is presented which indicates that the trophoblast of early pregnancy performs a significant secretory function, this period of activity being approximately contemporaneous with the time of greatest excretion of gonadotropin. In later pregnancy, there is evidence of reduced secretory activity. No convincing evidence of secretion was found in the small and large decidual cells of the *decidua parietalis*.

The Human Pyramidal Tract.

A. M. LASSEK (*Archives of Neurology and Psychiatry*, March, 1944) states that in cases of cerebral tumour, unilateral motor deficit, with one or more pyramidal tract signs, may occur with little or no loss of axones in the pyramidal tract. He points out, however, that in some of these cases the cells of origin of the pyramidal tract or the fibres arising from them may be temporarily deprived of function by pressure, anoxemia, narcotic poisoning or some other phenomenon. Nevertheless he finds it difficult to correlate the terminology employed in describing paralyzes with the destruction of the pyramidal tract.

British Medical Association News.

NOTICE.

LIBRARY: PHOTOSTAT SERVICE.

It is the earnest desire of the Council of the New South Wales Branch of the British Medical Association that the library should provide facilities which will ensure that members may have access to references in periodicals *et cetera* with as little inconvenience and delay as possible.

With this end in view a microfilm reader has been installed in the library, and at the present time inquiries are being made in regard to the matter of providing a photostat service for members, whereby printed photographs of articles can be made available to members for permanent use at a nominal cost. From these inquiries it has been ascertained that, despite wartime difficulties, all the equipment necessary, with the exception of a Leica camera, which is the essential item in such equipment, is procurable locally.

In order to avoid the necessity of having to waive the consideration of this matter for the duration of the war, the Council, in an endeavour to cover all avenues for obtaining the camera, wishes to make an appeal to any member who has a Leica camera for loan or sale, to offer his cooperation in this regard and so enable full consideration to be given to inaugurating this very necessary service, particularly for those on active service and in the country.

This service will be a most valuable and essential part of the library in the very near future, and the Council would be deeply appreciative of any assistance that could be rendered by any member who might possess a Leica camera (f. 3.5 millimetres).

Medical Societies.

THE OBSTETRIC STAFF OF THE WOMEN'S HOSPITAL, MELBOURNE.

A MEETING of the obstetric staff of the Women's Hospital, Melbourne, was held on June 21, 1944.

Induction of Labour.

The meeting took the form of a symposium on the induction of labour.

DR. W. IVON HAYES read a paper entitled "Medicinal Induction of Labour and Induction in Post-Maturity" (see page 421).

DR. W. D. SALTAU read a paper entitled "The Indications for Surgical Induction of Labour" (see page 424).

DR. A. M. HILL read a paper entitled "The Methods of Surgical Induction of Labour" (see page 425).

DR. MARGARET A. MACKIE read a paper entitled "Comparison between Surgical Induction of Labour by Means of the Rectal Tube and Surgical Induction of Labour by Artificial Rupture of the Membranes" (see page 428).

DR. GOODMAN asked whether induction of labour should be performed in women who had had previous dystocia due to large children. He also asked whether an anaesthetic was given when the membranes were artificially ruptured, and whether sulphonamide drugs were of use when given prophylactically.

Dr. Saltau, in reply, said that he was against induction of labour for previous dystocia, because of the possibility of obtaining a premature child whose future might be uncertain.

Dr. Hill explained that no anaesthetic was given for rupturing the membranes, except when difficulty was encountered. He also said that sulphonamide drugs were not given unless bacteriological examination of the vagina revealed the presence of infection, and only then if the organism was susceptible. When infection did take place in such cases it was usually due to anaerobic streptococci, which were resistant to sulphonamides.

DR. J. W. JOHNSTONE thought the papers had been informative and interesting. He said that the uterine forces were more important than the mechanics of labour, and he pointed out that Watson's method of medicinal induction utilized the function of uterine contraction; the quinine sensitized the uterus, the oil caused stimulation through the spinal cord and the pituitrin excited the uterus to contract. He described the peristaltic waves of contraction in the Müllerian ducts of animals and compared them with the

contractions in the human. He thought that the statistics submitted by Dr. Mackie demonstrated that foetal mortality was not increased by artificial rupture of the membranes.

DR. JOHN GREEN mentioned the antiquity of the method of inducing labour by rupture of the membranes, and said that Dr. Mackie had shown that it had always been justified by the results; but whereas formerly it had been performed usually for disproportion, now the commonest indication for its use was toxæmia. Dr. Green agreed with this trend and thought induction should be used mainly in toxæmia. He used medicinal induction for toxæmia in *primiparæ* when the head was fixed, but he rather "squibbed" mechanical induction. He thought toxæmic patients could be "coasted along" and then given medicinal induction; but when this was ineffective he used surgical methods. He did not usually give an anaesthetic to *primiparæ* when rupturing the membranes, but he gave "Seconal" as a preliminary measure and reassured the patient by telling her that something was going to be done which would help things on. He used a Kocher forceps to rupture the membranes, and did not give too much sedative, in order to avoid inertia. He said that if tubes were used, they should be removed in two or three days if labour did not begin.

DR. ROBERT SOUTHEY discussed the characteristics of post-mature children. He said the skin was dry and wrinkled, they were very lethargic and their feeding was difficult. He asked whether it was common for patients to carry their children for ten months; he had attended a patient who had done so, and who had told him that both her mother and sister had been one month overtime with all their pregnancies.

DR. FRANK HAYDON said that in the calculation of the approximate date of confinement, care should be taken to ascertain the length of the menstrual cycle, for if this was long or irregular, calculation from the last menstrual period would give an erroneous result. In these cases, in which the date of conception was unknown, many patients would go over the calculated date and yet the child would not be post-mature.

DR. JOHN O'DONOHUE related the particulars of the celebrated case of Gaskell *versus* Gaskell, in which the question of paternity was the ground for legal action. The child, weighing thirteen pounds, was born 330 days after coition. Dr. O'Donohue said that there was no specific sign of post-maturity in an infant, and while such a condition might be suggested by abnormal weight or length or by the presence of well-marked centres of ossification in the long bones, all were open to doubt. He mentioned a recent case in which he had given evidence. It also involved the question of paternity and depended on the fact that the husband had returned to military duty 336 days before the birth of the child.

DR. RONALD ROME said that of 237 *primiparæ* who were given medicinal stimulation at term, 47% came into labour after one treatment, and that 36% of *multiparæ* of thirty-six to forty weeks pregnant reacted to medicinal induction. He asked whether one or two rectal tubes were used in the hospital for tubal induction, as he was of the opinion that two tubes caused better uterine stimulation than one.

Dr. Mackie replied that occasionally two tubes were used, but it would be difficult to obtain statistics to show whether better results were obtained.

Dr. Hill said that in performing surgical induction it was important to see that the head would descend into the pelvis. The state of the cervix was also important, the rule being, "the shorter the cervix, the shorter the labour"; this was borne out by the opinion of some American obstetricians who thought that induction was contraindicated if the cervix was long and conical. The difficulty in assessing the significance of post-maturity as a cause of foetal death was that post-maturity was not a pathological entity. Dr. Hill suggested that for a certain time no induction be performed in the hospital solely for post-maturity, so that further statistics might be obtained to verify the opinion of Dr. Hayes. Dr. Hill thought that induction was indicated in cases of post-maturity in which the head was becoming disproportionate, and that these cases would be evident from the personal judgement and knowledge of the obstetrician.

DR. ELLIOT TRUE said that the meeting had been of value, especially for overthrowing the text-book opinion that the bag of waters was of the greatest importance and should be preserved. He thought there were a number of procedures and theories appearing in text-books and copied from one to another which ought to be discussed fully, and he hoped that in later meetings these contentious subjects would be dealt with.

Correspondence.

"BLUEPRINT FOR THE HEALTH OF A NATION."

SIR: On page 34 of Sir Raphael Cilento's book, "Blueprint for the Health of a Nation", there occurs a statement to the effect that: "In most States, for example, Victoria and South Australia, recorded medical men were extremely difficult to trace. . . . In no State were figures for numbers and distribution of medical men and hospitals available on first application."

Although the substance of this statement is perfectly true, the example chosen is unfortunately a wrong one, and reflects unjustly on the efficiency of the office staff of the Victorian State Medical Coordination Committee, which along with that in one other State formed a notable exception.

The figures supplied to the Medical Survey Committee in 1943 by the Medical Coordination Committees of Victoria and Western Australia (concerning medical men only) were complete and accurate.

In all other respects I must record my entire agreement with the accuracy of the statement and its general meaning.

Yours, etc.,

ARTHUR BROWN.

Colac,
Victoria,
September 27, 1944.

THE CONTROL OF TUBERCULOSIS.

SIR: The address by Dr. Douglas Anderson on tuberculosis control (THE MEDICAL JOURNAL OF AUSTRALIA, September 23, 1944) contained much excellent advice. His insistence on a much needed change in our handling of this disease is greatly to be welcomed. At the same time I feel that the 1938 all Australia mortality rate quoted by him might engender a certain complacency. In 1942 the rate in Victoria, in which State about one-third of all Australian deaths from the disease occur, was 44.7 per 100,000 inhabitants. In the same year the rate for Australia was 39, and for the United States of America (white and coloured population) 43.1, but the rate for the American white population was only in the region of 32. Further, the total death rate (white and coloured) diminished by 50.3% in the United States of America from 1925 to 1942, while the decline in Australia over the same period was only 37.1%. Thousands of Australian lives would have been saved if the death rate here had declined to the same extent as in Canada and the United States of America.

Dr. Anderson states that the number of beds advised by the National Tuberculosis Association of the United States of America is 1.5 to 2 per annual death. This, however, was some years ago. As pointed out in my article in the journal of July 15 last, the rate "recommended" by the American and Canadian Tuberculosis Associations is three beds per annual death. In the Canadian province of Ontario this rate was reached already in 1939. It is now nearly four. By 1942 a rate of three beds had been attained or surpassed in seven States in the United States of America, as well as in the District of Columbia and the Territories of Hawaii. As Dr. G. H. Wherrett, Secretary of the Canadian Tuberculosis Association, stated in October, 1943: "A minimum of three beds per death is required. No matter how carefully we scrutinize our patients to secure earlier discharges, no matter how much ambulant pneumothorax is used or home treatment utilized, we still require three beds per death."

I should especially like to support Dr. Anderson's remarks about prevention of the disease in hospital workers, nurses, students, doctors and others, and particularly among mental hospital employees. As regards trainee nurses, the group most commonly affected, I consider that all those who at the beginning of their training react positively to tuberculin, should have their chests radiographed every six months. Negative reactors should be tuberculin tested at least every four months. The nurse whose tuberculin reaction becomes positive should be closely and regularly supervised. Lateral, as well as postero-anterior radiographs, should be taken following the conversion of the tuberculin reaction. Enlarged mediastinal glands may well be missed in a postero-anterior film.

In view of the fact that it is impracticable to prevent tuberculin negative reactors from nursing tuberculous patients, serious consideration should be given to the pro-

phylactic use of "B.C.G." in the case of negative reactors who are likely to be exposed to infection. This has given satisfactory results in Norway, also in the Canadian province of Saskatchewan. Further, risk to all hospital staff will diminish when all patients admitted to public hospitals are fluorographed. "Active" cases will then be recognized and can be segregated. There must be a big improvement in mental hospital practice to bring us into line with Canada and United States of America, as regards (a) case-finding by X-raying every patient, (b) segregation of all active cases, (c) other measures to protect personnel and other patients. About 5% of deaths in Victorian State mental institutions are due to tuberculosis.

The compensation of hospital workers, who develop tuberculosis as a result of occupational contact, should be obligatory by law, as in nine American States, Hawaii and the Philippines (when under American control).

In conclusion, the nursing of the tuberculous should, I consider, be made much more attractive to women of the highest professional and personal qualifications. In this, I am in entire agreement with the comments of Dr. Anderson.

Yours, etc.,

HILARY ROCHE.

Austin Hospital,
Heidelberg,
Victoria.
September 30, 1944.

LIVER NECROSIS IN BURNS TREATED WITH TANNIC ACID.

SIR: The report by Major A. V. Jackson of two deaths from liver necrosis, after tannic acid treatment of burns, serves to corroborate the already large amount of evidence of the dangers of this treatment. I also consider the triple dye method equally dangerous.

After several years of research I believe that only wet methods should be used in the treatment of burns. Human blood serum or plasma are ideal agents, but are not always available. Physiological saline followed by normal saline are the next best. However, good results can be obtained with warm sterile tap water.

I believe that the first-aid treatment should be to bathe the burns with warm sterile tap water and place a warm wet pack on them. The attention of the first aider should then be confined to treating the great shock always present.

Yours, etc.,

F. W. SIMPSON.

Perth,
October 10, 1944.

CANCER OF THE CERVIX UTERI.

SIR: I have read with interest the paper by Dr. Schlink and Dr. Chapman in your issue of the seventh instant on "Cancer of the Cervix Uteri"; but in justice to those who have to advise sufferers from this disease, I feel that I must draw attention to the following points:

1. The authors in Table I compare the five-year statistics of their cases at Royal Prince Alfred Hospital from 1930 to 1942 with aggregate figures from sixteen world radiotherapeutic centres (quoted from Bourne and Williams). What should be emphasized is that only 258 cases in the first group are being compared with 9,051 cases in the second. Surely it is hardly justifiable in the circumstances to conclude, as is done, that the method of treatment in the first group, that is, combined radium and surgery, "saves an extra 4.4% of all patients". There are numerous statistical results from centres using radiotherapy alone, covering most of the leading medical schools and cancer clinics in the world, each treating many more cases than are presented in this paper, and each with a five-year survival rate greater than the authors' 28.6%. Twelve years ago, the famous Regaud published five-year figures of 33%, and these on cases treated seventeen and more years ago. Radiotherapy has developed enormously in technique and results since then.

I agree with the opinion expressed by Dr. Schlink and Dr. Chapman that nothing but absolute statistics should be accepted as the standard for comparing figures presented by the various clinics of the world. Then let us have absolute statistics. It is only fair to point out that the figures presented do not even represent all cases of this disease admitted to the Royal Prince Alfred Hospital during the period.

2. The authors claim "that the removal of irradiated cancerous tissues would provide a wealth of material for scientifically checking the curative effect of the application of radium". There are two fallacies in the claim. Firstly, radical hysterectomy is apparently done five weeks after the radium treatment. The time interval is important, and herein is criticism justified. I would expect to find cancer cells in a proportion of excised cervixes five weeks after radium application, but this does not warrant the conclusion that these cells will not disappear in later weeks. The full effect of radium may not be obtained for a period of two to three months. This is a fact well known to those using radiation extensively.

Secondly, any investigation of the biological effect of radiation must include a statement of the dose in units of quantity of radiation received at the point where the effect is being investigated. Milligramme-hours is not a dosage unit at all, and can no longer be accepted as such. The International Recommendations now demand that radium doses be expressed in *r* units. The paper makes no mention of the checking of the radium dose at various points round the cervix, and therefore as experimental work of this type is incomplete in one very important respect.

A dosage system is now available for the calculation of dosage for cancer of the cervix in *r* units, and the balancing of dosage at selected points in the pelvis. The use of such a system necessitates close cooperation with the physicist.

3. A statement is made that "the majority of radiotherapists admit that treatment by radium and X rays has no effect on cancer of the lymphatic glands". This is far from the known facts, and it is difficult to understand how Dr. Schlink and Dr. Chapman can speak for the majority of radiotherapists. I have never heard such a statement before. To say that radium or X rays has no effect on cancer of the lymphatic glands is quite untrue. Admittedly it is more difficult to produce cure of metastatic glands in certain sites than in others by radium or deep X-ray therapy, but the difficulties are often those of technique, and this statement does not apply to the pelvis. I have produced disappearance of secondary carcinomatous glands for five years by radiation alone; and the numerous published results in the treatment of cancer of the cervix *uteri* by radiation alone, and especially five-year survival in an appreciable percentage of the inoperable group, would seem to make it obvious that cancer of the pelvic glands is affected by radiation.

A more pertinent question to be answered in this paper would have been what percentage of cases with infected pelvic glands is saved by surgery. I am unable to deduce from the paper how many of the 20% of cases found to have glands invaded at operation lived for five years.

4. The authors state that they have abandoned the use of deep X-ray therapy entirely; but admit they have a limited experience of it. To come to such a conclusion it would seem that they have ignored the great mass of evidence which has been accumulated of the improvement in results when external X-ray therapy is added to the radium application, and the latest work showing further improvement with supervoltage X-ray apparatus.

It is most important that the combined radium and deep X-ray therapy should be organized as one course, with careful balancing of radium and X-ray dose; and the whole course should be carried out with the patient in hospital. The radiotherapist has too often been put in the position of having to treat a case as an out-patient, often some months after radium or surgery or both, and not infrequently with widespread recurrence by this time. How much better would it have been if a well-planned course had been carried out after close collaboration between surgeon, radiotherapist and physicist? The lack of available beds for patients undergoing deep X-ray therapy has been emphasized for many years by radiotherapists in Sydney, and in spite of this intolerable position the work has steadily increased.

5. Table IV towards the end of the paper presents a comparison of five and ten year cures for combined radium and surgery and radium alone for cases in Stages I, II and III of the disease. It is misleading. It should be pointed out that in the cases treated by radium and surgery and reviewed at five years, 62% are in Stages I and II, and only 38% in Stage III; whereas in the cases in which radium alone was used, only 11% were early, that is, in Stages I and II, and 89% were in the more advanced stage.

What is wanted in cancer work is a fair-minded statistical assessment of all known methods of treatment, and honest collaboration between all the specialties involved. I respectfully suggest to Dr. Schlink and Dr. Chapman that with further attention to the problems of physics involved in the application of a lethal dose of radiation to the pelvis,

their results may improve, and the radical surgical procedure found unnecessary in the vast majority of cases.

Yours, etc.,

135, Macquarie Street,
Sydney,
October 13, 1944.

HAROLD J. HAM.

DUPUYTREN'S CONTRACTURE.

SIR: With great interest I read the paper of Dr. C. E. Corlette in THE MEDICAL JOURNAL OF AUSTRALIA, August 19, on the subject of Dupuytren's contracture.

This condition was present in my father and in two of his maternal uncles, his mother having no trace of it.

My paternal great-grandfather had two sons and two daughters; both the sons had marked Dupuytren's contracture in both hands; neither daughter had this condition, though the son of one of them (my father) was affected. No other member of my family has been affected and all of them were known to me personally.

Of the three males affected, my father was the only one who used his hands with tools. In all three the condition was well marked before the age of forty. There was no history of injury at any time.

Trusting this may be of interest as an example of Dupuytren's contracture in more than one generation, passed down by a female who was herself free from the condition.

Yours, etc.,

MARIE BROWN.

46, Walkerville Terrace,
Gilberton,
Adelaide.
Undated.

Research.

WILLIAM GIBSON RESEARCH SCHOLARSHIP FOR MEDICAL WOMEN.

MISS MAUD MARGARET GIBSON has placed in the hands of the Royal Society of Medicine a sum of money sufficient to provide a scholarship of the yearly value of £220 in memory of her father, the late Mr. William Gibson, of Melbourne, Australia. The scholarship is awarded from time to time by the society to qualified medical women who are subjects of the British Empire, and is tenable for a period of two years, but may in special circumstances be extended to a third year. The next award will be made in July, 1945.

In choosing a scholar, the society will be guided in its choice either by research work already done by her, or by research work which she contemplates. The scholar shall be free to travel at her own will for the purpose of the research she has undertaken.

There is no competitive examination, nor need a thesis or other work for publication or otherwise be submitted. The society has power at any time to terminate the grant if it has reason to be dissatisfied with the work or conduct of the scholar.

Applications should be accompanied by a statement of professional training, degrees or diplomas, and of appointments, together with a schedule of the proposed research. Applications must be accompanied by testimonials, one as to academic or professional status, and one as to general character. Envelopes containing applications *et cetera* should be marked on the top left-hand corner "William Gibson Research Scholarship" and should be addressed to Mr. G. R. Edwards, Secretary, Royal Society of Medicine, 1, Wimpole Street, London, W.1, and be received not later than June 1, 1945.

Australian Medical Board Proceedings.

NEW SOUTH WALES.

THE following letter has been received from the Secretary of the New South Wales Medical Board.

Sir,
I am directed by the New South Wales Medical Board to inform you that reciprocity of medical registration, in terms of the Medical Practitioners Act, 1938/39, of New South

Wales, has now been established in respect of graduates in medicine of the University of Manitoba, Canada, who are registered with the College of Physicians and Surgeons of Manitoba, and graduates in medicine of the University of Sydney, who are registered with the New South Wales Medical Board.

This means that, subject to being an acceptable character, in good standing with this Medical Board and to establishment of identification, payment of fee *et cetera*, a medical practitioner with qualifications obtained at the University of Sydney may now become registered to practise in the Province of Manitoba, Canada, without any other conditions than those outlined above. This State will accept, in return, medical graduates of the University of Manitoba, under similar conditions.

The address of the Registrar of the College of Physicians and Surgeons of Manitoba is 605, Medical Arts Building, Winnipeg, Manitoba, Canada, but it would be desirable for any person who might be interested in obtaining registration in Manitoba to communicate with this Board in the first instance.

Yours, etc.,

G. R. FLEMING, Secretary.

Sydney,

October 11, 1944.

The undermentioned have been registered, pursuant to the provisions of the *Medical Practitioners Act, 1938-1939*, of New South Wales, as duly qualified medical practitioners:

Allworth, Colin Travers, M.B., B.S., 1944 (Univ. Sydney), Balmain District Hospital, Balmain.
 Badham, Charles David, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Baker, Stephen Percy, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital.
 Bestie, Arthur Edwin, M.B., B.S., 1944 (Univ. Sydney), Balmain District Hospital, Balmain.
 Burditt, Arthur Robert, M.B., B.S., 1944 (Univ. Sydney), Prince Henry Hospital, Little Bay.
 Cameron, Barry Wallace Graham, M.B., B.S., 1944 (Univ. Sydney), Mater Misericordiae Hospital, North Sydney.
 Caro, Ewen Stanley, M.B., B.S., 1944 (Univ. Sydney), Western Suburbs Hospital, Croydon.
 Carroll, Brian Edward, M.B., B.S., 1944 (Univ. Sydney), Lewisham Hospital, Lewisham.
 Cassidy, Desmond John, M.B., B.S., 1944 (Univ. Sydney), Lewisham Hospital, Lewisham.
 Clifton-Smith, Shirley, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
 Cohen, Morris, M.B., B.S., 1944 (Univ. Sydney), Perth General Hospital, Western Australia.
 Colditz, Gordon Manning, M.B., B.S., 1944 (Univ. Sydney), Sydney Hospital, Sydney.
 Conacher, Colin James Ross, M.B., B.S., 1944 (Univ. Sydney), Sydney Hospital, Sydney.
 Conomy, Albert Bruce, M.B., B.S., 1944 (Univ. Sydney), Sydney Hospital, Sydney.
 Corlette, Philip Manning Christian, M.B., B.S., 1944 (Univ. Sydney), Newcastle Hospital, Newcastle.

Obituary.

ANTON BREINL.

DR. ANTON BREINL, whose death was recorded recently in this journal, was one of the pioneers in Australia of research in tropical medicine and into the effect of tropical climate on the white man. That after some years of useful work at Townsville he felt compelled to abandon research was a disaster for Australian medicine, for he had not only conducted research of his own, but had stimulated other workers in the tropical sphere.

Anton Breinl was born in Bohemia in 1880 and studied medicine at the University of Prague, where he took the degree of Doctor of Medicine, 1904. He at once showed his interest in the scientific side by acting as demonstrator in pathological anatomy at his own university. In the year of his graduation he was appointed John Garrett International Fellow in Bacteriology and proceeded to the Liverpool School of Tropical Medicine. In 1905 he went as leader of a scientific group to study yellow fever in the Upper Amazon,

and in the course of his work became infected by the disease. Subsequently he was appointed assistant lecturer at the Liverpool school and in 1907 became director of the Runcorn Research Laboratory at Liverpool. About this time he made investigations in trypanosomiasis and contracted the infection in the laboratory. He had been working on the treatment of trypanosomiasis with arsenical drugs, and he is said to have been the first white man cured of the disease by "Atoxyl".

In 1909 Breinl became the first director of the Institute of Tropical Medicine at Townsville, Queensland. At Townsville Breinl threw himself heart and soul into the work of the institute. Soon after his arrival he made a medical survey in the islands of the Torres Straits and carried out investigations in New Guinea and the Northern Territory. He was, of course, already known as a parasitologist and as an investigator of note in tropical medicine, for in 1910 the University of Liverpool awarded him the Mary Kingsley Medal, an honour conferred on "distinguished scientists who have specialized in the field of tropical medicine and kindred subjects". After he had been in Townsville for a year or two additions were made to the scientific staff of the Townsville Institute and Breinl initiated a series of studies into the physiological effects of a tropical climate on the white man. He did a great deal of work himself and inspired those who worked with him. The results of some of his investigations were published in this journal. Eventually, at the eleventh session of the Australasian Medical Congress, held at Brisbane in 1920, he gave the opening address at the plenary session on the permanent occupation of tropical Australia by a healthy indigenous white race, and the following were his conclusions, based on eleven years' work.

1. The facts collected and the observations reported tend to prove that from the point of view of incidence of diseases other than tropical, North Queensland does not differ essentially from Central or Southern Queensland.
2. Tropical diseases, with the exception of hookworm infection, are only scarce and easily controlled.
3. Our investigations with regard to the physiology of the inhabitants of the coastal areas of North Queensland, when compared with those of a temperate climate, have so far only shown a few quantitative but no qualitative changes.
4. Up to the present the investigations carried out at the Tropical Institute have not brought to light any facts indicating that health and disease as prevailing in North Queensland should make a permanent settlement by a white race impossible.

It is much to be regretted that Breinl was not able to continue the valuable work which he had started at Townsville and which he had carried on through the difficult period of the war of 1914-1918. It has been said that he relinquished his post because of post-war intolerance, and there is evidence that he was not always treated by men of science as a man of his international eminence should have been treated. Other reasons have been given for his retirement from the Townsville Institute in 1920. Whatever the reason was, he did not speak of it in latter years when he was questioned on the subject of medicine in the laboratory and medicine in general practice. He gave no sign of bitterness or resentment. On the matter of values he only smiled and pointed out that in practice a good living was much more easily earned than in the laboratory; and his companion received the impression perhaps of regret and certainly of a knowledge that the path of the investigator was the more difficult of the two and infinitely the more worth while. During the war of 1914-1918 Breinl had acted for a time as superintendent of the Townsville Hospital, and his entry into private practice was a simple matter. He had served the laboratory with distinction and with unflagging zeal; he carried the qualities of thoroughness and of a sense of duty with him in his everyday work among the Townsville people in their homes. A former colleague of his in the Townsville Institute has said of him that he "was a splendid man to work with, enthusiastic, very hard working and always ready to give the other fellow more than his share of credit". Breinl's memory will be honoured in the years to come when the history of tropical medicine in Australia is written.

JOHN LOCKHART GIBSON.

WE regret to announce the death of Dr. John Lockhart Gibson, which occurred on September 30, 1944, at Toowong, Queensland.

KENNETH JOSEPH GILMORE WILSON.

We regret to announce the death of Dr. Kenneth Joseph Gilmore Wilson, which occurred on October 8, 1944, at Brisbane.

Naval, Military and Air Force.

CASUALTIES.

ACCORDING to the casualty list received on October 14, 1944, Captain E. McL. J. Baker, A.A.M.C., Sale, Victoria, has been placed on the "seriously ill" list.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Dowd, Bryan Thomas, M.B., B.S., 1943 (Univ. Sydney), R.A.A.F. Station, Tocumwal, New South Wales.
Bennett, Victor Jack, M.B., B.S., 1943 (Univ. Sydney), P.O. Box 17, Millthorpe, New South Wales.
Swain, John Philip, M.B., B.S., 1942 (Univ. Sydney), 2/6 Australian General Hospital, A.I.F.
McInerney, James Furlong, M.B., B.S., 1942 (Univ. Sydney), R.M.O., 2/43 Infantry Battalion, A.I.F., Australia.
Irvine, Allan Francis, M.B., 1943 (Univ. Sydney), 190, Anzac Parade, Kensington, New South Wales.

The undermentioned have been elected members of the New South Wales Branch of the British Medical Association:

Caro, Ewen Stanley, M.B., B.S., 1944 (Univ. Sydney), Western Suburbs Hospital, Croydon.
Diment, Edward Maxwell, M.B., B.S., 1944 (Univ. Sydney), Wollongong Hospital, Crown Street, Wollongong.
Dobell-Brown, Stephen William, M.B., B.S., 1938 (Univ. Sydney), 4, Tivoli Avenue, Rose Bay.
Duncan, George Craig, M.B., B.S., 1943 (Univ. Sydney), NX203773, Captain G. C. Duncan, 70 Australian Camp Hospital, Greta, New South Wales.
Goswell, George Basil, M.B., B.S., 1942 (Univ. Sydney), 267238, Flight Lieutenant G. B. Goswell, Group 247, Birdum, Northern Territory.
Grieve, Peter William Harvey, M.B., B.S., 1943 (Univ. Sydney), NX203552, Captain P. W. H. Grieve, 3/14 Australian Field Ambulance, Australia.
Kent, Pauline Ashenden, M.B., B.S., 1944 (Univ. Sydney), Base Hospital, Wagga Wagga.
Laidlaw, Christopher William Francis, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.
Manuel, Pattie Flora, M.B., B.S., 1942 (Univ. Sydney), Royal Alexandra Hospital for Children, Camperdown.
McGuinness, Alan Edward, M.B., B.S., 1935 (Univ. Sydney), NX77831, Major A. E. McGuinness, 2/9 Australian General Hospital, A.I.F., Australia.
O'Reilly, Merrick John Justyn, M.B., B.S., 1939 (Univ. Sydney), Post Office Residence, Parramatta.
Quinn, William Matthew James, M.B., B.S., 1941 (Univ. Sydney), N282633, Captain W. M. J. Quinn, 2/6 Australian Infantry Battalion, Australia.
Scanlan, Frederick Joseph, M.B., B.S., 1944 (Univ. Sydney), Royal North Shore Hospital, St. Leonards.
Schofield, Catherine Phyllis, M.B., B.S., 1943 (Univ. Sydney), Women's Hospital, Crown Street, Sydney.
Taverny, James Maurice, M.B., B.S., 1944 (Univ. Sydney), 519, Payne Place, Albury.
Turk, Harvey Coleman, M.B., B.S., 1942 (Univ. Sydney), NX203564, Captain H. C. Turk, 114 Australian General Hospital, Goulburn.
Vanderfield, Geoffrey Keith, M.B., B.S., 1944 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

Medical Appointments.

Dr. Everton Rowe Trethewie has been appointed Director of the Institute of Medical and Veterinary Science, Adelaide.

Dr. Irene May O'Loughlin has been appointed Clinical Pathologist at the Institute of Medical and Veterinary Science, Adelaide.

Diary for the Month.

Oct. 24.—New South Wales Branch, B.M.A.: Ethics Committee.
Oct. 25.—Victorian Branch, B.M.A.: Council Meeting.
Oct. 26.—New South Wales Branch, B.M.A.: Branch Meeting.
Oct. 27.—Queensland Branch, B.M.A.: Council Meeting.
Nov. 1.—Victorian Branch, B.M.A.: Branch Meeting.
Nov. 1.—Western Australian Branch, B.M.A.: Council Meeting.
Nov. 2.—South Australian Branch, B.M.A.: Council Meeting.
Nov. 3.—Queensland Branch, B.M.A.: Branch Meeting.
Nov. 3.—Victorian Branch, B.M.A.: Legislative Subcommittee.
Nov. 7.—New South Wales Branch, B.M.A.: Organization and Science Committee.
Nov. 10.—Queensland Branch, B.M.A.: Council Meeting.
Nov. 13.—Victorian Branch, B.M.A.: Hospital Subcommittee.
Nov. 13.—Victorian Branch, B.M.A.: Finance Subcommittee.
Nov. 14.—Victorian Branch, B.M.A.: Organization Subcommittee.
Nov. 14.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
Nov. 14.—Tasmanian Branch, B.M.A.: Branch Meeting.
Nov. 15.—Western Australian Branch, B.M.A.: Branch Meeting.
Nov. 16.—Victorian Branch, B.M.A.: Executive Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmalm United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phoenix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia.

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